Basic Course Information

Semester	**Winter 2019**	Instructor Name	**Jim Pendley**
Course Title & #	**BIOL 220; General Microbiology**	Email	**pendley@imperial.edu**
CRN #		Webpage (optional)	
Room		Office	
Class Dates		Office Hours	
Class Days	**MTWRF**	Office Phone #	
Class Times Units	**0830-1040** **11:00-1:10; 1:30-3:40** **5**	Office contact if student will be out or emergency	**Department Secretary** **(760) 355-6155**

Course Description

Provides students with fundamental concepts of the structure and physiology of non-disease and disease producing microorganisms with particular attention to bacteria. Basic techniques for culturing, staining, counting and identifying microorganisms. Designed to meet the requirement to enter one of the medical fields as well as general education. (CSU, UC)

Student Learning Outcomes

Upon course completion, the successful student will have acquired new skills, knowledge, and or attitudes as demonstrated by being able to:

1. accurately explain the basic principles of microbiology, which include but are not limited to: structure and functions of prokaryotic and eukaryotic cells, microbial metabolism, bacterial/molecular genetics, pathogenesis, virology, and immunology. (ILO1, ILO2)
2. devise a dichotomous key to aid in the identification of disease-causing bacteria in the lab, and accurately identify disease-causing bacteria by using the key and experimental techniques. (ILO1, ILO2)
3. perform experimental techniques in microbiology correctly to test hypotheses, determine characteristics of microbes and perform diagnostics. (ILO2)
4. apply lecture and laboratory concepts with critical thinking to explain experimental data and scenarios in microbiology not addresses directly in class/laboratory. (ILO1, ILO2)
5. fully participate in classroom and laboratory activities. (ILO3)

Course Objectives

Upon satisfactory completion of the course, students will be able to:

1. The student will list and describe the major historical events in the field of microbiology and the people and experiments involved. The student will also describe different schemes of classification and utilize them to classify and identify microorganisms.
2. The student will describe different types of microscopy, their usage, advantages, and explain the general

physical laws governing their operation.

3. The student will describe the general morphology of microorganisms and explain their associated cellular physiology.

4. The student will recognize and apply various techniques and factors necessary for optimum growth of different microorganisms.

5. The student will describe different modes of reproduction among microorganisms and calculate reproduction rates and population size of microorganisms. Student will differentiate among methods of producing pure cultures and describe cultural characteristics of microorganisms.

6. The student will describe enzyme structure and explain enzyme function, regulation, and measurement of activity.

7. The student will describe and explain the various biochemical reactions and pathways of metabolism.

8. The student will describe the various means of inheritance and recombination in microorganisms and explain the results of various genetic situations. The student will describe technique of recombinant DNA.

9. The student will describe death and death-rate determination in microorganisms and explain the effects of various physical and chemical agents on microorganisms.

10. The student will describe chemotherapeutics including antibiotics and will explain the action of antibiotics in microorganisms including measurement of activity.

11. The student will describe the normal microbial flora of the human and explain the infection process and the host's defensive response.

12. The student will explain the theory of common diagnostic techniques and describe their usage.

13. The student will describe the epidemiology and the various modes of transmission of infectious diseases.

14. The student will list and describe the bacterial cause, symptoms, prognosis, and treatment of selected human diseases.

15. The student will list and describe the viral prion cause, symptoms, prognosis, and treatment of selected human diseases.

16. The student will list and describe the fungal or protozoan cause, symptoms, prognosis, and treatment of selected human diseases.

17. The student will list and describe the viral or bacterial cause, symptoms, prognosis, and treatment of selected plant diseases.

Textbooks & Other Resources

Required Texts

1. Microbiology, An Introduction. By Totora, Funke and Case; (13th Edition) Pearson -Cummings ISBN # 13: 978-0-321-73360-3

2. Lab Manual: Microbioloy, Laboratory Theory and Application (Brief Edition) 2nd Edition Morton Publishing. ISBN# 089582947-9

Course Requirements and Instructional Methods

This course includes both lecture and lab component. In order to pass the class you need to participate in both portions of the class which includes regular attendance and participation in both lecture and lab. In addition to all the exams you must take the final exam to receive a passing grade.

Out of Class Assignments: The Department of Education policy states that one (1) credit hour is the amount of student work that reasonably approximates not less than one hour of class time and two (2) hours of out-of-class time per week over the span of a semester. WASC has adopted a similar requirement.

Course Grading Based on Course Objectives

Your grade is based on the cumulative points you get in both lecture and lab exams. You are expected to keep track of your progress during the course.

Four lecture exams -100 points each
Final exam – 100 points Gram
stain Test- 20 points
Minor Unknown Identification- 50 points
Major Unknown Identification – 100 points
Research Paper – TBD
Quiz – Points distribution will be discussed in the class

Grading Scale:
A = 90% and above
B=89-80%
C=79-70%
D=60-60%
F= Below 60%

- **Attendance** A student who fails to attend the first meeting of a class or does not complete the first mandatory activity of an online class will be dropped by the instructor as of the first official meeting of that class. Should readmission be desired, the student's status will be the same as that of any other student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See General Catalog for details.
- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absences exceed the number of hours the class is scheduled to meet per week may be dropped.
- Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.
- **Be on time!**

Classroom Etiquette

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class, unless otherwise directed by the instructor.
- Food and Drink are prohibited in all classrooms. Water bottles with lids/caps are the only exception. Additional restrictions will apply in labs. Please comply as directed.
- Disruptive Students: Students who disrupt or interfere with a class may be sent out of the room and told to meet with the Campus Disciplinary Officer before returning to continue with coursework. Disciplinary procedures will be followed as outlined in the General Catalog.
- Children in the classroom: Due to college rules and state laws, no one who is not enrolled in the class may attend, including children.

Academic Honesty

- Plagiarism is taking and presenting as one's own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to 'cite a source' correctly, you must ask for help.

Cheating is defined as fraud, deceit, or dishonesty in an academic assignment, or using or attempting to use materials, or assisting others in using materials that are prohibited or inappropriate in the context of the academic assignment in question.

Anyone caught cheating or will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the General School Catalog for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to, the following: (a) plagiarism; (b) copying or attempting to copy from others during an examination or on an assignment; (c) communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment; (e) using a commercial term paper service.

Additional Help – Discretionary Section and Language

Library Services: There is more to our library than just books. You have access to tutors in the Study Skills Center, study rooms for small groups, and online access to a wealth of resources.

We have an embedded tutor for the class to give additional review and help

Disabled Student Programs and Services (DSPS)

Any student with a documented disability who may need educational accommodations should notify the instructor or the Disabled Student Programs and Services (DSP&S) office as soon as possible. The DSP&S office is located in Building 2100, telephone 760-355-6313, if you feel you need to be evaluated for educational accommodations.

Student Counseling and Health Services

Students have counseling and health services available, provided by the pre-paid Student Health Fee. We now also have a fulltime mental health counselor. For information see http://www.imperial.edu/students/student-health-center/. The IVC Student Health Center is located in the Health Science building in Room 2109, telephone 760-355-6310.

Student Rights and Responsibilities

Students have the right to experience a positive learning environment and due process. For further information regarding student rights and responsibilities, please refer to the IVC General Catalog available online at http://www.imperial.edu/index.php?option=com_docman&task=doc_download&gid=4516&Itemid=762

Information Literacy

Imperial Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources. Students can access tutorials at http://www.imperial.edu/courses-and-programs/divisions/arts-and-letters/library-department/info-lit-tutorials/

Anticipated Class Schedule / Calendar

Week 1 Day 1 Wednesday, Jan 2, 2019

Biology 220 – Laboratory Exercise

Ex. No.	Name	Organisms	Medium	Date In	Date Read
3-1	Microscope	Prepared slides Letter "e"	None		-
Equipment	Letter "e" slides and three typical bacteria (commercially prepared)				

Ex. No.	Name	Organisms	Medium	Date In	Date Read
2-1	Sampling Environment		Nutrient Agar plates	1/2	1/3
Reagents/Media	NA/ Plates (15)				

Week 1 Day 2 Thursday, January 3, 2019

Ex. No.	Name	Organisms	Source Medium	Date In	Date Read
1-3 thro 1-6; 2-6 3-4	Aseptic Transfer Aerotolerance Simple Stain	*Bacillus subtilis* *Psuedomonas aeruginosa* *Staphylococcus aureus*	N/Agar 24-48 hour (15 of each)	1/3	1/4
Reagents/Stains	Methylene blue, safranin, crystal violet|| paper towels, slides N/Broth (15); N/A Plates (15); TSA Slants (15); Deep N/ATubes (45)				

Week 1 Day 3 Friday, January 4, 2019

Biology 220 – Laboratory Exercise

Ex. No.	Name	Organisms	Source Medium	Date In	Date Read
3-6; 3-8	Gram Stain Capsule Stain	*Staphylococcus aureus* *Escherichia coli* *Klebsiella pneumoniae* *Enterobacter aerogenes* *E. coli*	TSA or N/A 24-48 hour (15 of each)		-
Reagents/Stains	Crystal violet; Gram's Iodine; 90% EtOH; safranin;Carbolfuchsin;Acid EtOH;egg albumin; Methylene blue; Nigrosin;Maneval's stain				
	END of WEEK 1				

Ex. No.	Name	Organisms	urce Medium	Date In	Date Read
3-9; 3-7	Endospore Acid-fast	*Bacillus subtilis*	TSA or N/A Slants;48-72 hour(15 of each		
Reagents/Stains	Malachite Green;Safranin (0.5% aqueous); Depression slides **MINOR UNKNOWN DISTRIBUTED**				

Week 2 Day 2 Tuesday, January 8, 2019

Ex. No.	Name	Organisms	Source Medium	Date In	Date Read
4-1; 4-4;	Manitol Salt EMB	*Staph.aureus* *Staph.epidermidis* *E.coli* *Enterobacter aerogenes* *Proteus vulgaris* *Klebsiella pnuemoniae*	TSA or N/A Slants 24-48 hour (15 each)	1/8	1/10
Reagents/Stains	Manitol Salt agar Plates (15); EMB plates (15) **Gram Stain Test – List will be provided**				

Week 2 Day 3 Wednesday, January 9, 2019

5-2; 5-3; MR-VP	Phenol Red Broth	*Klebsiella pneumoniae* *Micrococcus roseus* *Psuedomonas aeruginosa Enterobacter aerogenes E.coli* *Proteus vulgaris*	TSA or N/A Slants 24 – 48 h. (15 of each)	Tue 1/9	Thur Chk 1/10 End 1/11
Reagents/Stains	Phenol Red Broth tubes with Glucose (45); lactose (45); sucrose (45) w/Durham tubes MR-VP broth tubes (30); Methyl Red; VP Reagent A and B; Clean Test Tubes (15)				

Week 2 Day 4 Thursday, January 10, 2019

Ex. No.	Name	Organisms	Source Medium	Date In	Date Read
5-4	Catalase Test	*Enterococcus faecalis* *Staphylococcus aureus* *Psuedomonas aeruginosa*	TSA Slants 24-48 hour (15 each)	1/10	1/11

No.	Name	Organisms	Source medium	Date In	Date Read
5-7	Citrate Decarboxylase test Phenyldeaminase test	*Enterobacter aerogenes* *E.coli* *Klebsiella pneumoniae* *Proteus vulagaris* *Proteus mirabilis*	N/A or TSA Slants; 24-48 hour (15 Each)	1/10	Chk 1/14 End 1/16
Reagents/Media	Simmons Citrate Agar Slants (30);				
Reagents	H_2O_2 (Fresh); Plastic squeeze pipets; BBL Slides (15)				

Week 2 Day 5 Friday, January 11, 2019

Ex. No.	Name	Organisms	Source Medium	Date In	Date Read
5-11 5-12	Starch Hydrolysis Gelatinase test	*Staphylococcus aureus* *Staphylococcus epidermidis* *Escherichia coli* *B.subtilis*	N/A or TSA Slants (15 Each)	Tue 1/11	Tue 1/18
Reagents/Media	Starch agar Plates (15); gelatin tubes (30)				

Week 3 Day 1 Monday, January 14, 2019

Ex. No.	Name	Organisms	Source Medium	Date In	Date Read
5-13 5-14	Urea hydrolysis	*Proteus mirabilis* *Escherichia coli* *Klebsiella pnuemoniae* *Enterobacter aerogenes*	Nutrient Broth 24-48 hour culture (15 each)	1/14	1/15
Stains/Media	Urea slants (30)				

Ex. No.	Name	Organisms	Source Medium	Date In	Date Read

5-17	SIM	*E.coli* *Proteus vulgariss* *Proteus mirabilis* *Psuedomonas aeruginosa*	N/broth 24 hour culture (12 of each)	1/14	- 1/15
Media/Equip.	SIM medium tubes (30); Kovac's reagent				

Week 3 Day 2 Tuesday, January 15, 2019

Ex. No.	Name	Organisms	Source Medium	Date In	Date Read
7-3 (Old Lab Manual)	Kirby Bauer	*E.coli* *Staph.aureus* *Psuedomonas aeruginosa*	Seeded TSA Plates; 24 hour cultures (15 each)	Tue 1/15	Wed 1/17
Reagents/Media	Assorted antibiotic saturated discs; Small Rulers				

MAJOR UNKNOWNS ISSUED - REPORT DUE on Thurs. 31, 12 noon.

Refer to Exp. 9.1, 9.2, 9.3

Week 5 Day 4 Thursday, Jan 31, 2019

Ex. No.	Name	Organisms	Source Medium	Date In	Date Read
		MAJOR UNKNOWN REPORT DUE			