Basic Course Information

Semester:	**Spring 2019**	Instructor Name:	**Fatima Villalobos**
Course Title & #:	**BIOL 220, Microbiology**	Email:	**fatima.villalobos@imperial.edu**
CRN #:	**20046**	Webpage (optional):	
Classroom:	**2712**	Office #:	**Rm 2712 for Office Hours**
Class Dates:	**2/11/2019- 6/7/2019**	Office Hours:	**W 8:40-9:40**
Class Days:	**MW**	Office Phone #:	
Class Times:	0940-1105; 1115-0225	Emergency Contact if student will be out or emergency	Department Secretary(760) 355-6155
Units:	5		

Course Description

Course 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.

Course Prerequisite(s) and/or Corequisite(s)

Prerequisite: MATH 091 and CHEM 100 and BIOL 100 or BIOL 120 or BIOL 180 or BIOL 182 with grades of "C" or better; or MATH 091 with a grade of "C" or better and current California LVN/RN license.

Student Learning Outcomes

Satisfactory completion of the class entails the ability to do the following:

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

1. The student will list and describe the major historical events in the field of microbiology and the people and experiments involved.
2. The student will also describe different schemes of classification and utilize them to classify and identify microorganisms.
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. 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 cause, symptoms, prognosis, and treatment of selected human diseases caused by bacteria, viruses and other microbes.

Textbooks & Other Resources or Links

Required Texts

1. Microbiology, An Introduction. By Tortora, Funke and Case, 13th ed. Pearson-Cummings (may use any edition from the 10th onwards)

2. Lab Manual- Microbiology, Laboratory, Theory and Application. By Michael Leboffe and Burton Pierce (Brief Edition). 3rd edition. Morton Publishing Co.

Course Requirements and Instructional Methods

This class includes both lectures and laboratory portions. In order to pass this class, students must participate in both portions of the class, including regular attendance and performing experiments. **Lectures and labs are an essential part of this course; therefore, attendance in both and note-taking are required.** Students are also expected to complete all assignments, take all exams, participate in any field trips or other class related activities.

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 the result of what YOU do.

Your grade is based on both Lecture and Laboratory. **Do NOT miss any lecture or lab sessions.** If you miss 4 or more instructional sessions **(lecture and/or lab)**, you may be dropped from the course. If you cannot make it to class due to illness or emergency, please contact me **ASAP!**

Your overall grade is based on the following:

1. Four lecture exams=400pts total. **If you are a DSPS student, please inform me ASAP and remember to submit the forms at least 1week before EACH exam (including the final) so I can make the proper accommodations in a timely manner.**

2. There may also be several "homework" assignments or pop quizzes worth 10-20 pts each. These are designed to help you to review the materials covered in class.

3. Laboratory portion: lab notebook (20pts), plus 2 bacteria identification exercises and write-ups- known as "minor unknown" and "major unknown" exercises (at least 50pts each-exact points TBA) and possible quizzes.

Grading Scale: The student's semester grade will be determined by the total number of points the student has earned in both the laboratory and lecture sections. The points are then divided by the total number of points possible to get a "percentage score." I do not "curve" exam scores or overall grades
A=90.0% of total points
B=80.0% "
C=70.0% "
D=60.0% " F

When calculating final grades, I will round up to the nearest percent. For example, if you get a 79.5%, this becomes an 80%.

Make up Policy**: There will be NO make-up labs!**

A student may take a make up a test due to the following reasons: 1. Medical reasons – student's or immediate family member's illness. 2. Legal reasons – student is required to be in court. 3. Family tragedy/emergency – e.g. death in the family. Make up exam must be taken within 1 week of the originally scheduled date.

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. For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and 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.

Classroom Etiquette

Electronic Devices: Cell phones and electronic devices must be turned off and put away during class. Absolutely **No Texting** or other online activities are allowed during the lecture or laboratory sessions**. If you use any electronic devices during an exam, your exam score will be reduced by 50%.**

- **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 by the instructor.
- 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, only students enrolled in the class may attend; children are not allowed.

Online Netiquette

- What is netiquette? Netiquette is internet manners, online etiquette, and digital etiquette all rolled into one word. Basically, netiquette is a set of rules for behaving properly online.
- Students are to comply with the following rules of netiquette: (1) identify yourself, (2) include a subject line, (3) avoid sarcasm, (4) respect others' opinions and privacy, (5) acknowledge and return messages promptly, (6) copy with caution, (7) do not spam or junk mail, (8) be concise, (9) use appropriate language, (10) use appropriate emoticons (emotional icons) to help convey meaning, and (11) use appropriate intensifiers to help convey meaning [do not use ALL CAPS or multiple exclamation marks (!!!!)].

Academic Honesty

Academic honesty in the advancement of knowledge requires that all students and instructors respect the integrity of one another's work and recognize the important of acknowledging and safeguarding intellectual property.

There are many different forms of academic dishonesty. The following kinds of honesty violations and their definitions are not meant to be exhaustive. Rather, they are intended to serve as examples of unacceptable academic conduct.

- 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 plagiarizing 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 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 Student Services

Imperial Valley College offers various services in support of student success. The following are some of the services available for students. Please speak to your instructor about additional services which may be available.

- CANVAS LMS. Canvas is Imperial Valley College's main Learning Management System. To log onto Canvas, use this link: Canvas Student Login. The Canvas Student Guides Site provides a variety of support available to students 24 hours per day. Additionally, a 24/7 Canvas Support Hotline is available for students to use: 877-893-9853.
- Learning Services. There are several learning labs on campus to assist students through the use of computers and tutors. Please consult your Campus Map for the Math Lab; Reading, Writing & Language Labs; and the Study Skills Center.
- 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.

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. Please contact them 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.

- **Student Health Center**. A Student Health Nurse is available on campus. In addition, Pioneers Memorial Healthcare District provide basic health services for students, such as first aid and care for minor illnesses. Contact the IVC Student Health Center at 760-355-6128 in Room 1536 for more information.
- **Mental Health Counseling Services**. Short-term individual, couples, family and group counseling services are available for currently enrolled students. Services are provided in a confidential, supportive, and culturally sensitive environment. Please contact the IVC Mental Health Counseling Services at 760-355-6310 or in the building 1536 for appointments or more information..

Veteran's Center

The mission of the IVC Military and Veteran Success Center is to provide a holistic approach to serving military/veteran students on three key areas: 1) Academics, 2) Health and Wellness, and 3) Camaraderie; to serve as a central hub that connects military/veteran students, as well as their families, to campus and community resources. Their goal is to ensure a seamless transition from military to civilian life. The Center is located in Building 600 (Office 624), telephone 760-355-6141.

Extended Opportunity Program and Services (EOPS)

The Extended Opportunity Program and Services (EOPS) offers services such as priority registration, personal/academic counseling, tutoring, book vouchers, and community referrals to qualifying low-income students. EOPS is composed of a group of professionals ready to assist you with the resolution of both academic and personal issues. Our staff is set up to understand the problems of our culturally diverse population and strives to meet student needs that are as diverse as our student population.

Also under the umbrella of EOPS our CARE (Cooperative Agency Resources for Education) Program for single parents is specifically designed to provide support services and assist with the resolution of issues that are particular to this population. Students that are single parents receiving TANF/Cash Aid assistance may qualify for our CARE program, for additional information on CARE please contact Lourdes Mercado, 760-355- 6448, lourdes.mercado@imperial.edu.

EOPS provides additional support and services that may identify with one of the following experiences:

- Current and former foster youth students that were in the foster care system at any point in their lives
- Students experiencing homelessness
- Formerly incarcerated students

To apply for EOPS and for additional information on EOPS services, please contact Alexis Ayala, 760-355-5713, alexis.ayala@imperial.edu.

Student Equity Program

- The Student Equity Program strives to improve Imperial Valley College's success outcomes, particularly for students who have been historically underrepresented and underserved. The college identifies strategies to monitor and address equity issues, making efforts to mitigate any disproportionate impact on student success and achievement. Our institutional data provides insight surrounding student populations who historically, are not fully represented. Student Equity addresses disparities and/or disproportionate impact in student success across disaggregated student equity groups including gender, ethnicity, disability status, financial need, Veterans, foster youth, homelessness, and formerly incarcerated students. The Student Equity Program provides direct supportive services to empower students experiencing insecurities related to food, housing, transportation, textbooks, and shower access. We recognize that students who struggle meeting their basic needs are also at an academic and economic disadvantage, creating barriers to academic success and wellness. We strive to remove barriers that affect IVC students' access to education, degree and certificate completion, successful completion of developmental math and English courses, and the ability to transfer to a university. Contact: 760.355.5736 or 760.355.5733 Building 100.
- The Student Equity Program also houses IVC's Homeless Liaison, who provides direct services, campus, and community referrals to students experiencing homelessness as defined by the McKinney-Vento Act. Contact: 760.355.5736 Building 100.

Student Rights and Responsibilities

Students have the right to experience a positive learning environment and to due process of law. For more information regarding student rights and responsibilities, please refer to the IVC General Catalog.

Information Literacy

Imperial Valley College is dedicated to helping students skillfully discover, evaluate, and use information from all sources. The IVC Library Department provides numerous Information Literacy Tutorials to assist students in this endeavor.

Anticipated Class Schedule/Calendar

Tentative Schedule

WK	DATE	LECTURE		LABORATORY
1	11-Feb	Intro: Chapter 1		Ex 2-1 Sampling Environment
	13-Feb	Chapter 3		Ex 3-1 Microscope
2	**18-Feb**	**Holiday**		**Holiday**
	20-Feb	Chapter 2		Ex 1-4, 1-5, 3-4
3	25-Feb	Chapter 2		Ex 2-6, Ex 3-6 Gram Stain
	27-Feb	Chapter 4		Ex 3-8
4	4-Mar	Exam #1		Ex 3-9 Endospore Stain

	6-Mar	Chapter 5		Ex 3-7 Acid-Fast
5	11-Mar	Chapter 5		Ex 4-3 MSA, & practice Gram Stain
	13-Mar	Chapter 6		Ex 4-5 EMB & Minor Unknown Distributed
6	18-Mar	Chapter 6		Ex 4-4 MacConkey Agar
	20-Mar	Chapter 7		Ex 5-2 Phenol Red
7	25-Mar	Chapter 8		Ex 5-3 Methyl red-Vogues Proskauer
	27-Mar	Chapter 8		Ex 5-4 Catalase
8	1-Apr	Chapter 10-11		Ex 5-8
	3-Apr	Chapter 10-11		Ex 5-9
9	8-Apr	Chapter 12		Minor Unknown
	10-Apr	Chapter 13		Minor Unknown due
10	15-Apr	Chapter 13		Ex 5-14, 5-10
	17-Apr	Chapter 14, Exam #2		Exam #2
11	29-Apr	Chapter 14		Ex 5-15
	1-May	Chapter 15		Ex 5-18
12	6-May	Chapter 16		Ex5-19
	8-May	Chapter 17		Ex 5-23
13	13-May	Chapter 17, Exam #3		Exam #3
	15-May	Chapter 21		Major unknown
14	20-May	Chapter 22		Major unknown
	22-May	Chapter 23		Major unknown
15	**27-May**	**Holiday**		**Holiday**
	29-May	Review		Major Unknown
16	3-Jun	Review		Finish Major unknown; clean out lockers/check out
	5-Jun	Exam #4		

*****Tentative, subject to change without prior notice*****

Lab Syllabus

You will need your own: lab coat or outer protection (like an oversized apron or T-shirt); Goggles or protective eyewear; Colored wax pencils or permanent marker; a sewn in signature laboratory book w/ sturdy cover.

PLEASE READ THE LAB EXERCISE IN ADVANCE!!! I cannot emphasize this enough. We have a tight schedule in the lab- as a result, you must be ready to do the lab the second you walk into the lab. Reading the exercises in advance will enable you to finish the lab exercises successfully within the allotted time. Remember, lab exercises cannot be made up, since the materials are available ONLY on the day we're scheduled to do the lab.

No food in lab, safe shoes (closed-toe), no jewelry that may cause risk. Tie back long hair- we do work with open flames in the lab. Please observe all safety and disposal rules (to be discussed in the 1st lab session; summarized in "Introduction" chapter of your laboratory manual)

You will be instructed in and checked for proper storage and cleaning of your microscope. If your scope is found to be dirty or not stored properly, you will have points taken off from your overall grade.

Lab Format:

1. Lab is held twice a week. Each lab session begins with instructions and background info which will help you understand what you need to do in lab. This usually lasts 20 minutes or so. So please be on time for these important instructions.

2. During the lab "lecture", I will give an overview of the lab exercises we'll do for that day- but I will not cover all the details in the interest of time. I expect you to know these details by reading the lab in advance. The "lectures" are meant to give you an idea of what you need to do. So read all lab assignments in advance or you will not be able to do and complete the lab successfully.

3. You will work in groups of 2 most of the time (ie-w/ a lab buddy); however, you will work individually on the minor and major unknown exercises.

4. Most labs require multiple sessions to complete. Usually you set up the lab in one session, let the bacteria multiply until the next lab session, and then you'll look at the results. It's up to you to keep track of when you start and finish a lab exercise- reading the lab exercise in advance helps you to keep track of this!

5. To grow bacteria, put it in the incubator. Then remove bacteria from incubator next session. If you need to "store" bacteria (i.e. if you need the bacteria beyond the next session), store them in the 'fridge--do NOT return the bacteria to the incubator. Discard bacteria as soon as you're done with the experiment.

6. We will also do more than one exercise per lab session—it's up to you how you organize your time (and decide which experiment to do first). Again, reading the exercises in advance will enable you to organize your time more efficiently. If you do not pre-read the exercises you will not be able to organize your time and you'll end up wasting a lot of time deciding what to do.

7. All materials needed will be placed on the front desk or the counters in the lab, do not take anything from the prep room or the 'fridges without the instructor's permission.

8. Follow all safety rules. - including where to discard things!!! (will go over this in lab)

9. There are NO make-up labs. Please do NOT be absent from the lab! Again, I cannot emphasize the importance of reading the lab exercises in advance. This will help you organize your work in lab, allow you to make efficient use of your time and help you keep track of the progress of your lab experiments.

Grading and points in the lab:

A. Possible Quizzes (10-20 points each)

B. Minor unknown: lab exercise in which you identify bacteria using mostly staining techniques learned in the first half of the semester. Need to devise a strategy for doing this based on the techniques you learn in the lab and on the characteristics of the bacteria determined by using these techniques. Worth At least 50 points

C. Major unknown: Identification of unknown bacteria using staining techniques AND biochemical tests that you have learned during the ENTIRE semester- worth at least 50 points. (we will go over the minor and major unknowns in more detail later in the semester). You will also turn in lab reports for these.

D. Lab Log book/ notebook. due at the end of semester, format given below-20 points

Lab Log Book/notebook Format- please use notebook w/ sewn-in spine!

Name on Cover
First Page- Name, Room Number 2712, Date
2 nd and 3rd Page- table of contents (Lab exercises)
4 th Page. Start recording lab exercises in this style:

1. Title of lab exercise
2. Purpose: why we're doing this lab; what are we trying to find out by doing this lab.
3. Materials and Methods: what did you do? please use your own words- the best way is to summarize what you did (pretend you have to explain what you did in a paragraph)
4. Data/Results: what did you see or observe? Use tables, drawings if needed
5. Conclusions/Discussion: what does the data tell you? Did you find out what you were trying to find out? (did you address the questions/issues you mentioned in the "purpose" section?). Explain how the data allowed you to draw these conclusions. Answering the questions in the lab book will assist you here as well.
6. Please number the pages.

I will spot check your lab log book/notebook several times this semester (no advanced warning given). Please do not wait until the end of the semester to complete this!