



**Course Title: Microbiology**

**Course Number: BIO 250**

**Prerequisites: BIO 116 or BIO 211**

**Credits: 4**

**Instructor:**

**Phone:**

**Email:**

**Office:**

**Office Hours:**

**COURSE DESCRIPTION:** Microbiology is a course designed for the following programs: Cooperative Nursing, Respiratory Care, Medical Assisting, and SAM-Biology option. In this course students study the principle of microorganisms and how they cause human disease. Specifically, this course covers the anatomy of microorganisms and their use in biotechnology, characteristics of viruses, antimicrobial drugs and contribution of microorganisms to human diseases (effects on the immune system, lymphatic system, nervous system, respiratory system, digestive system, urinary system and the reproductive system).

**Students Outcomes/ OBJECTIVES:**

**Upon completion of this course, the following objectives will be achieved:**

- Identify and classify microorganisms
- Comprehend the importance and apply safety and aseptic techniques in labs and healthcare
- Explain how atoms form molecules and chemical bonds
- Compare the size, shape, and arrangement of prokaryotic and eukaryotic cells using the microscopes to identifying and classifying microorganisms
- Differentiate between the different microbial metabolic reactions & Analyze the different requirements for microbial growth and explain the factors that affect this growth
- Identify the structure, function of the microbial genetic material and the regulation of gene expression
- Compare the different tools of biotechnology used in experiment, analyze the different methods of classifying and identifying microorganisms
- Differentiate and compare gram positive and gram negative bacteria
- Compare and contrasts the characteristics of fungi, algae, protozoa and helminthes
- Define the characteristics and structure of viruses, their mechanism of replication and transforming normal cells.



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- Discuss the different actions of antimicrobial drugs, the mechanism of resistance and microbial mechanisms of pathogenesis
- Differentiate between different microbial diseases affecting the immune system & describe adaptive and innate immunity and defenses of the host
- Distinguish between different microbial diseases of the skin and eye, nervous, cardiovascular, lymphatic, the upper and lower respiratory system, the digestive system, the urinary and reproductive system
- Define selective media and explain its effect on bacterial growth and test the effect of different environmental factors on microbial growth
- Experiment and discuss how to identify an unknown microorganism

### 3. TEXTBOOK REQUIRED:

TEXTBOOK: Tortora, Funke and Case; Microbiology; An introduction 11th edition, Pearson. ISBN-13: 978-0321796677, ISBN-10: 0321796675 Edition: 11th

Required Lab Manual Information: Leboffe M. and Pierce B.: Microbiology; Laboratory Theory & Application 2nd edition; Morton Publisher ISBN 9781617312021 2nd edition

### 4. EVALUATION METHODS:

- |                     |          |
|---------------------|----------|
| ➤ Two lecture exams | 10% each |
| ➤ Two lab exams     | 10% each |
| ➤ Lab reports       | 10%      |
| ➤ Midterm           | 25%      |
| ➤ Final exam        | 25%      |
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- **A ( 95-100), A- (90-94), B+ ( 86-89), B (80-85), B- (75-79)**
  - **C+ (71-74), C ( 65-70) , D ( 60-64), F (LESS THAN 60)**

### Detailed Weekly Schedule

Week #	Lecture Topic	Lab Topic
1	Introduction to the Course  The Microbial World and You: naming and classifying microorganisms	Lab Safety Rules Aseptic techniques
2	Chemical Principles & Classification of microorganisms	Inoculation Methods
3	Functional Anatomy of Prokaryotic and Eukaryotic Cells	Introduction to Light Microscopes & Simple Stain



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4	The Prokaryotes: Domains Bacteria and Archaea	Gram Stain
5	<b>Exam I</b> Microbial Growth	<b>Exam I</b>
6	Microbial Genetics	Microbial Growth- part 1
7	Biotechnology and DNA technology	Microbial Growth- part 2
8	Microbial Metabolism	Differential and Structural Stain- Part 1
9	Viruses, Viroids, and Prions	Differential and Structural Stain- Part 2
10	<b>Exam II</b> Microbial Mechanisms of Pathogenesis	<b>Exam II</b>
11	Antimicrobial Drugs	Selective Media
12	Adaptive and Innate Immunity and Host Defense	Differential Tests
13	Microbial Diseases affecting Various Human Systems	Antimicrobial Drugs and Bacteria Growth
14	Review & Presentations	<b>Lab Exam</b> – Identification of unknown
15	<b>Final Exam</b>	

**Attendance & Make Up Exams.** Students are expected to follow attendance guidelines as presented in the syllabus provided by the instructor. However, in case of an emergency or illness, students are advised to notify their instructor or counselor immediately. The instructor will determine the validity of the absence. The exceptions to instructor discretion exist when members of armed forces are called for training or assignment or any case where students are legally required to be elsewhere. Pending the submission of appropriate documentation reasonable accommodations for make-up work shall be provided, and in accordance with guidelines included in the syllabus. Make up exams will be given only in extenuating circumstances. It is your responsibility to let me know that you missed an exam. All make up exams are more difficult than the original.

**COURSE REQUIREMENTS.** Attendance, punctuality and participation are required. Students missing more than 2 classes may receive a failing grade. Cell phones should be turned off in the classroom.

**Lab Format:** Unless indicated otherwise, each laboratory exercise is set up for team of four-five students. Each student on the team is to participate in every



aspect of the lab exercise. After each exercise, a formal lab report is handed in for grading. The lab reports are written (word processed) individually, not as a team, and handed in during the next lab session. You are required, by department policy, to follow all safety procedures. Each lab team is responsible for cleaning up their work area after every lab.

**Library Component:** Students are encouraged to use the library to complete their research paper. They may use database such as: Science @direct, EBSCO, and many others. The paper must follow the APA format and the student must select and extract a peer review research journal article, and write a two pages' review on that research article. You should use the HCCC library database and other resources

**Incomplete:** An INCOMPLETE grade for the course is given under specific conditions when a student, because of serious and unexpected reasons, cannot complete the requirements of the course. For example, if a student did not attend the final because of illness his or her excuse must be verified by a physician. Other absences from other assigned activities must be made up at another appointed time. To arrange for an incomplete grade, the student must see the instructor before final exam.

#### **ACADEMIC INTEGRITY**

Academic integrity is central to the pursuit of education. For students at HCCC, this means maintaining the highest ethical standards in completing their academic work. In doing so, students *earn* college credits by their honest efforts. When they are awarded a certificate or degree, they have attained a goal representing genuine achievement and can reflect with pride on their accomplishment. This is what gives college education its essential value.

Violations of the principle of academic integrity include:

- Cheating on exams.
- Reporting false research data or experimental results.
- Allowing other students to copy one's work to submit to instructors.



- Communicating the contents of an exam to other students who will be taking the same test.
- Submitting the same project in more than one course, without discussing this first with instructors.
- Submitting *plagiarized work*. *Plagiarism* is the use of another writer's words or ideas without properly crediting that person. This unacknowledged use may be from published books or articles, the Internet, or another student's work.

When students act dishonestly in meeting their course requirements, they lower the value of education for all students. Students who violate the college's policy on academic integrity are subject to failing grades on exams or projects, or for the entire course. In some cases, serious or repeated instances of academic integrity violations may warrant further disciplinary action.

### **DISABILITY SUPPORT SERVICES**

Students with disabilities who believe that they might need accommodations in this class are encouraged to schedule an appointment with Disabilities Support Services at (201) 360-4157, as soon as possible to better ensure that such accommodations are implemented in a timely fashion. All disabilities must be documented by a qualified professional such as a Physician, Licensed Learning Disabilities Teacher Consultant (LDTC), Psychiatrist, Psychologist, Psychiatric Nurse, Licensed Social Worker or Licensed Professional Counselor, who is qualified to assess the disability that the student claims to have and make recommendations on accommodations for the student. All information provided to the Disability Support Services Program will be confidential between the program, professors involved with the student, and individual student.

“Mandatory Use of HCCC Email Address: Members of the HCCC community are required to check their official HCCC email address in order to stay current with College and course communications. All college business communication between faculty, students, and staff must be sent via an official HCCC email address. If an employee or student elects to forward or link his/her HCCC email to a separate and private account, that individual remains responsible for all material transmitted to that account. Employees of HCCC shall not be responsible for any material that remains undelivered, due to defects in the private non-HCCC accounts. Failure in the operations of private email accounts shall not be cause for excuse from communications between the student and the employee. Students that encounter difficulty with HCCC email should view the FAQ's section on the Portal. “

### **USE OF ELECTRONIC COMMUNICATION DEVICES:**

Cell phones and all other devices are not allowed during class or lab times. **All of them Telephone, iPod or computer**



## **Diversity, Equity, and Inclusion Statement**

Hudson County Community College (HCCC) fosters a welcoming environment that celebrates and encourages culturally responsive curricula, respects diverse viewpoints, and values discussions without censure or hostility. Our classrooms are strengthened by embracing all student voices and identities. The President's Advisory Council on Diversity, Equity, and Inclusion (PACDEI) encourages students to review DEI resources and initiatives at the following link:

<https://myhudson.hccc.edu/teamsites/Pages/pacdei.aspx>

## **Statement on Camera Usage in Remote Learning Environments**

*As a college, we strive to be student-centered and therefore encourage faculty to consider a student's individual circumstances (need for privacy, technological problems, etc.) when requiring that they turn on cameras during class. There is no legal prohibition on faculty requiring cameras be turned on during classes or college policy prohibiting such requests. If students are unable to turn their cameras on, they should communicate the circumstances to the faculty member. On-campus spaces are also available to students as an alternative to home or off campus online and remote instruction. The on-campus spaces include: Gabert Library L219, L221, L222, L419, STEM Building S217, and North Hudson Campus N224, N303D. Within these rooms, students will have access to computers, web cameras, and headsets. If there are any issues with space capacity, there are several additional rooms that can be utilized.*

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