



OFFICIAL COURSE SYLLABUS
Microbiology
BIOL 2120

**Semester with
Course Reference
Number (CRN)** **BIOLOGY 2120**
58131

**Instructor contact
information (phone
number and email
address)** **Audrey.bush@hccs.edu**
(713-718

**Office Location
and Hours** **Pinemont Campus Room 131**
Wednesday After Class, 1:55 PM-2:55 PM

**Course
Location/Times** **Microbiology Laboratory, Biol 2120 Prefix**
Wednesday/Pinemont 11:00 AM-1:50 PM

**Course Semester
Credit Hours (SCH)** **SPRING, 2018**
**(lecture, lab) If
applicable** **Laboratory** **3**
Hours:

**Total Course
Contact Hours**

Course Length 16
(number of weeks)

Type of Instruction **In-Class Laboratory**

**Course
Description:** Study of the morphology, physiology, and taxonomy of representative groups of pathogenic and nonpathogenic microorganisms. Pure cultures of microorganisms grown on selected media are used in learning laboratory techniques. Includes a brief overview of food microbes, public health, and immunology. Core Curriculum course

**Course
Prerequisite(s)** **PREREQUISITE(S):**

- BIOL 1406
- College-level reading (or take GUST 0342) and

- College-level writing (or take ENGL 0310/0349)

**Academic
Discipline/CTE
Program Learning
Outcomes**

PSLO#1 - Will display an understanding of biological systems and evolutionary processes spanning all ranges of biological complexity, including atoms, molecules, genes, cells, and organisms.

PSLO#2 - Will integrate factual and conceptual information into an understanding of scientific data by written, oral and/or visual communication. (This may include successful completion of a course-specific research project or a case study module).

PSLO#3 - Will demonstrate proficiency and safe practices in the use of laboratory equipment and basic laboratory techniques.

PSLO#4 - Will apply principles of the scientific method to problems in biology in the collection, recording, quantitative measurement, analysis and reporting of scientific data.

**Course Student
Learning
Outcomes (SLO):**

Bio 2120 - LABORATORY

1. Apply scientific reasoning to investigate questions and utilize scientific tools such as microscopes and laboratory equipment to collect and analyze data.
2. Use critical thinking and scientific problem-solving to make informed decisions in the laboratory.
3. Communicate effectively the results of scientific investigations.
4. Identify unique structures and capabilities of microorganisms.
5. Compare the life cycles of different types of viruses.
6. Discuss how microscopy has revealed the structure and function of microorganisms.
7. Give examples of the range of metabolic diversity exhibited by microorganisms, impact of metabolic characteristics on growth, and control of growth.
8. Classify interactions of microorganisms on human and non-human hosts as neutral, detrimental, or beneficial.

**Learning
Objectives
(Numbering
system should be
linked to SLO -
e.g., 1.1, 1.2, 1.3,
etc.)**

Bio 2120 – LABORATORY INVESTIGATION #1

OBJECTIVES:

1. **To name the parts of a compound light microscope and know their functions.**
2. **To learn the correct use of a compound light microscope**
3. **To observe different types of microorganisms**

**SCANS and/or
Core Curriculum
Competencies: If
applicable**

Core Curriculum Competencies:

Laboratory reports, a laboratory practical exam and class activities will enhance the learning process by giving the student the opportunity to demonstrate the basic intellectual competencies of reading, writing, speaking, listening, and showing critical thinking and problem solving ability.

**Instructional
Methods**

The laboratory experience is intended to be hands on activities that supports the curriculum of the Microbiology course. The laboratory investigations have been

**Student
Assignments**

Chosen with the intent to optimize students' microbiology experience.
Laboratory Investigations #1-#12 and #15

Bio 2120 – LABORATORY INVESTIGATION #2

OBJECTIVES:

1. To learn how to use an inoculating loop
2. To learn aseptic technique for transferring bacterial cultures
3. To learn to prepare a bacterial smear
4. To learn a simple staining procedure
5. To study bacterial morphology

Bio 2120- LABORATORY INVESTIGATION #3

OBJECTIVES;

1. To understand the purpose of negative staining
2. To learn the negative staining procedure

Bio 2120- LABORATORY INVESTIGATION #4

OBJECTIVES;

1. To isolate bacteria by the streak plate technique
2. To prepare and maintain a pure culture
3. To understand the purpose for isolation of a pure culture

Bio 2120-LABORATORY INVESTIGATION #5

OBJECTIVES:

1. To understand the purpose of Gram staining
2. To learn the procedure for Gram staining
3. To identify bacteria as Gram-positive or Gram-negative
4. To understand the mechanism for Gram staining

Bio 2120-LABORATORY INVESTIGATION #6

OBJECTIVES:

1. To learn a procedure for acid-fast staining
2. To distinguish between acid-fast and non acid-fast bacteria
3. To understand the clinical purpose of this differential staining procedure

Bio 2120-LABORATORY INVESTIGATION #7

OBJECTIVES:

1. To perform positive and negative staining on bacterial endospores
2. To differentiate bacterial endospores from the vegetative cells
3. To identify the morphology and location of bacterial endospores

Bio 2120-LABORATORY INVESTIGATION #8

OBJECTIVES:

1. To recognize bacterial capsules
2. To understand the nature and function of the capsules

Bio 2120-LABORATORY INVESTIGATION #9

OBJECTIVES:

1. To understand the function of flagella
2. To observe bacterial flagella and their arrangements
3. To learn the hanging drop technique for direct motility observation with the light microscope
4. To determine motility of bacteria by using a motility test medium

Bio 2120-LABORATORY INVESTIGATION #10

OBJECTIVES:

1. To understand the purpose of using selective, differential, and enriched media
2. To understand the difference between selective, differential and enriched media
3. To be able to interpret the results of bacterial growth on selective, differential and enriched media

Bio 2120-LABORATORY INVESTIGATION #11

OBJECTIVES:

1. To carry out a bacterial gas requirement assay and interpret the different growth patterns
2. To understand the five groups of microorganisms based on their gas requirements

Bio 2120-LABORATORY INVESTIGATION #12

OBJECTIVES:

1. To appreciate the stringent guidelines used in the milk industry

2. To count the total number of viable bacteria in a sample of milk
3. To learn serial dilution methodology

Bio 2120-LABORATORY INVESTIGATION #15

OBJECTIVES:

1. To understand the physiological role of carbohydrate fermentation by bacteria
2. To interpret carbohydrate fermentation tests.

Apply microbiology laboratory safety rules and maintain lab equipment and lab environment in accordance with those rules.

Laboratory assessment

Perform standard microbiological lab techniques including, use of the bright field microscope, aseptic technique, smear preparation and staining, inoculation/streaking techniques, media preparation, serial dilutions, and incubation protocols. Assess students on observations, data and comprehension.

Instructor's Requirements

There will be an **assessment on each laboratory investigation. Oral interactions with the instructor, one comprehensive practical examination**

Students must adhere to the rules and policies in the Houston Community College student handbook.

Program/Discipline Requirements: If applicable

Comprehensive Departmental Final Examination

HCC Grading Scale:

A = 100- 90	4 points per semester hour
B = 89 - 80:	3 points per semester hour
C = 79 - 70:	2 points per semester hour
D = 69 - 60:	1 point per semester hour
59 and below = F	0 points per semester hour
FX (Failure due to non-attendance)	0 points per semester hour
IP (In Progress)	0 points per semester hour
W (Withdrawn)	0 points per semester hour
I (Incomplete)	0 points per semester hour
AUD (Audit)	0 points per semester hour

IP (In Progress) is given only in certain developmental courses. The student must re-enroll to receive credit. COM (Completed) is given in non-credit and continuing education courses.

FINAL GRADE OF FX: Students who stop attending class and do not withdraw themselves prior to the withdrawal deadline may either be dropped by their professor for excessive absences or be assigned the final grade of "FX" at the end of the

semester. Students who stop attending classes will receive a grade of "FX", compared to an earned grade of "F" which is due to poor performance. Logging into a DE course without active participation is seen as non-attending. Please note that HCC will not disperse financial aid funding for students who have never attended class.

Students who receive financial aid but fail to attend class will be reported to the Department of Education and may have to pay back their aid. A grade of "FX" is treated exactly the same as a grade of "F" in terms of GPA, probation, suspension, and satisfactory academic progress.

To compute grade point average (GPA), divide the total grade points by the total number of semester hours attempted. The grades "IP," "COM" and "I" do not affect GPA.

Health Sciences Programs Grading Scales may differ from the approved HCC Grading Scale. For Health Sciences Programs Grading Scales, see the "Program Discipline Requirements" section of the Program's syllabi.

Instructor Grading Criteria

Laboratory Reports
Oral Reports
Laboratory Practical (1)

Instructional Materials

LAB Manual: Lab Manual For Microbiology 2120

HCC Policy Statement:

Access Student Services Policies on their Web site:

<http://hccs.edu/student-rights>

HCC ADA Statement:

Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office at the Northeast College at the beginning of each semester. Instructors are authorized to provide only the accommodations requested by the Disability Support Services Office. If you have any special needs or disabilities that may affect your ability to succeed in college classes or participate in any college programs or activities, please contact the DSS office for assistance.

ADA counselor contact information:

Cynthia De Los Santos
(713)718 - 8322
Codwell Campus
Learning Hub

HCC Policy Statement: Academic Honesty

Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Disciplinary proceedings may be initiated by the college system against a student accused of scholastic dishonesty. Penalties can include a grade of "0" or "F" on the particular assignment, failure in the course, academic probation, or even dismissal from the college. Scholastic dishonesty includes, but is not limited to, cheating on a test, plagiarism, and collusion.

HCC Policy Statement: Student attendance, Repeaters, withdrawal deadline

Attendance

Students are expected to attend classes and laboratory sessions regularly. Instructors check class attendance daily. It is the student's responsibility to always sign his/her name on the attendance sheet. **2 points** shall be deducted from the final grade for each laboratory or class session missed.

A student may be dropped from a course for excessive absences after the student has accumulated absences in excess of 12.5% of the hours of instruction (including lecture and laboratory time). **Note that 12.5% is approximately 4 classes or laboratory sessions for a 4-semester hour course.**

Students are responsible for materials covered during their absences, and it is the student's responsibility to consult with instructors for make-up assignments. Habitual tardiness will not be tolerated. Students are expected to be in attendance for the entirety of the scheduled class and are responsible for completing assignments scheduled during their absence/s. It is the student's responsibility to amend their professional/personal schedule to meet the provided class schedule.

1. The Title IX statement has been change to the following (changes in red) to address student pregnancy concerns:

*Houston Community College is committed to cultivating an environment free from inappropriate conduct of a sexual or gender-based nature including sex discrimination, sexual assault, sexual harassment, and sexual violence. Sex discrimination includes all forms of sexual and gender-based misconduct and violates an individual's fundamental rights and personal dignity. **Title IX prohibits discrimination on the basis of sex-including pregnancy and parental status-in educational programs and activities. If you require an accommodation due to pregnancy please contact an Abilities Services Counselor.** The Director of EEO/Compliance is designated as the Title IX Coordinator and Section 504 Coordinator. All inquiries concerning HCC policies, compliance with applicable laws, statutes, and regulations (such as Title VI, Title IX, and Section 504), and complaints may be directed to:*

2. A statement regarding how receive help regarding a student request for an accommodation due to a qualified disability has also been added:

EGLS3 -- Evaluation for Greater Learning Student Survey System

HCC strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please meet with a campus Abilities Counselor as soon as possible in order to establish reasonable accommodations. Reasonable accommodations are established through an interactive process between you, your instructor(s) and Ability Services. It is the policy and practice of HCC to create inclusive and accessible learning

environments consistent with federal and state law. For more information, please go to <http://www.hccs.edu/district/students/disability-services/>

[disAbility Services - Houston Community College | HCC](#)

www.hccs.edu

Get Started at HCC We're excited that you're joining the Eagle community. How to Apply Just follow these simple steps to register. Honors College

Repeaters

Students who repeat a course for a third or more times may soon face significant tuition/fee increases at HCC and other Texas public colleges and universities. Please ask your instructor / counselor about opportunities for tutoring / other assistance prior to considering course withdrawal or if you are not receiving passing grades.

Withdrawals

Withdrawal from the course after the official day of record (see current catalog) will result in a final grade of "W" on the student transcript and no credit will be awarded. It is the student's responsibility to initiate and complete a request for withdrawal from any course. Students will be required to formally request a drop from their instructors prior to the administrative drop date deadline (**Monday, March 31st 2014**). Abandoning the course or failing to formally drop, will result in a grade being given based on the work completed for the entire course (including missed exams).

At Houston Community College, professors believe that thoughtful student feedback is necessary to improve teaching and learning. During a designated time near the end of the term, you will be asked to answer a short online survey of research-based questions related to instruction. The anonymous results of the survey will be made available to your professors and department chairs for continual improvement of instruction. Look for the survey as part of the Houston Community College Student System online near the end of the term.

Distance Education and/or Continuing Education Policies

**Access DE
Policies on their
Web site:**

http://de.hccs.edu/Distance_Ed/DE_Home/faculty_resources/PDFs/DE_Syllabus.pdf

**Access CE
Policies on their
Web site:**

<http://hccs.edu/CE-student-guidelines>

LECTURE TOPICS

Chapter 1	The Main Theme of Microbiology
Chapter 2	The Chemistry of Biology
Chapter 3	Tools of the Laboratory: The methods for Studying Microorganisms
Chapter 4	A Survey of Prokaryotic Cells and Microorganisms
Chapter 5	A Survey of Eukaryotic Cells and Microorganisms
Chapter 6	An Introduction to Viruses
Chapter 7	Elements of Microbial Nutrition, Ecology, and Growth
Chapter 8	An Introduction to Microbial Metabolism: The Chemical Crossroads of Life
Chapter 9	Microbial Genetics
Chapter 10	Genetic Engineering: A Revolution in Molecular Biology
Chapter 11	Physical and Chemical Agents for Microbial Control
Chapter 12	Drugs, Microbes, Host – The Elements of Chemotherapy
Chapter 15	Adaptive, Specific Immunity and Immunization

LABORATORY EXERCISES

Exercise 1	Care and Use of the microscope	1/17
Exercise 2	Smear Preparation, Simple Staining and Bacterial Morphology	1/24
Exercise 3	Negative Staining, Test #1	1/31
Exercise 4	Isolation of Bacteria Using the Streak Plate Method	2/7
Exercise 5	Gram Staining	2/14
Exercise 6	Acid-Fast Staining	2/21
	Mid Term Test	2/28
Exercise 7	Bacterial Endospores	3/7
Exercise 8	Bacterial Capsules	3/21
Exercise 9	Bacterial Flagella and Motility Testing	3/28
Exercise 10	Selective, Differential, and Enriched Media	4/4
Exercise 11	Gas Requirements for the Growth of Bacteria	4/11
Exercise 12	Counting Bacteria in Milk Using the Pour-Plate Method	4/18
Exercise 15	Carbohydrate Fermentation by Bacteria	4/25
	LAB PRACTICAL	5/2
	ORAL DISCUSSION OF LAB PRACTICAL, Q/A	5/9

“Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. Furthermore, please notify the professor if you are comfortable in doing so.” It is also extremely important that you update all of your appropriate course syllabi affected by the revised session dates.

“At HCC the safety of our students, staff, and faculty is our first priority. As of August 1, 2017, Houston Community College is subject to the Campus Carry Law (SB11 2015). For more information, visit the HCC Campus Carry web page at <http://www.hccs.edu/district/departments/police/campus-carry/>.”



THIS SYLLABUS IS SUBJECT TO MODIFICATION

STUDENTS MUST ADHERE TO THE FOLLOWING INFORMATION:

1. Students are NOT to eat in the Laboratory
2. Extreme tardy individuals (30 minutes or more after class has begun) should omit entrance
3. The Laboratory Practical Exam will be weighed as **two test grades**.
4. If there are extenuating circumstances whereas the student is allowed to be administered the missed Lab Exam, he/she must do the following:
 - a) **Present a signed letter from your doctor.**
 - b) **If you have jury duty, you must present the proper documentation.**
5. **ELECTRONICS:**
 - a) **Computers** may be used to take notes. All other times computers are to be **turned off**.
 - b) **Cell Phones** are to be on **Vibrate** in order not to interrupt instructions. Students must NOT use Google to answer questions. You may bring your textbook to Lab to provide supplementary resource material.
 - c) **Smart Watches** must not be used to provide answers.
6. Students are not allowed to use the restroom during testing.
7. There is a penalty for turning in assignments after the due date. A letter grade dropped each missed day.
8. Students must not bring guest to the laboratory
9. Students are expected to attend classes regularly. A student **must drop** from a course for excessive absences. If the student does not drop for his/her excessive absences, he/she will receive **a letter grade of F in the class**.