

Microbiology Bio 230.00
Spring 2020 Syllabus

Course Description:

Biol 230 is 5 hrs (2 hour lecture, 3 hour laboratory) **3 credit hour** course. Topics include scope, historical aspects, taxonomy, and survey of the microbial world. The course also includes a survey of genetics, viruses, epidemiology, immunity, and microbial disease. Required for admission to the nursing program. Not accepted for credit toward the biology Major I. Prerequisites: BIOL 102 or 120; CHEM 100,101 (or higher- check with Chemistry Department).

Lecture: Wednesday 9:10-11am (At Hunter Main Campus, Rm 118 North);
Asynchronous distance learning (for lecture) as of 4/2/20

Laboratory: 3 hours per week. Depends on Section. Brookdale Campus;
Distance learning established as of 4/2/20

Course Coordinator and Instructor:

Janette Gomos Klein, Ph.D.
klein@genectr.hunter.cuny.edu
818 Hunter North

Office Hours: Thursday 10:00-12:00pm (818HN) by appointment – please email

Bb and MasteringMicrobiology grading and concerns:

Armin Lahiji, Ph.D.
lahiji@genectr.hunter.cuny.edu

Lab Coordinator:

Evan Lee
elee@genectr.hunter.cuny.edu

Required Texts:

*REQUIRED -Bb ready Modified MasteringMicroBiology-you enter code through the Bb course site or buy when you first enter through Bb site

Tortora Funke Chase. Modified MasteringMicrobiology with eText 13th Ed (for Bb use).
Pearson. ISBN: 9780134707310

The ebook and MasteringMicrobiology are included in this but it does NOT include paper book. You MUST buy this version OR ISBN 978013470797 (without etext) only as it will be integrated into Bb.

*REQUIRED- Laboratory Manual. Each student is responsible for turning in specific pages from the manual for grading.

Johnson Case. Laboratory Experiments in Microbiology, 12/E. 2019. ISBN: 0134605209

Laboratory Instructors:

Randy Arroyave
Wednesday evening, Thursday evening
rahiguita@gmail.com

Sushmita Bagchi
Tuesday afternoon, evening, and Friday afternoon
Sush_bag@yahoo.com

David Karpe
Thursday morning
dvdkrp@gmail.com

Martina Kucerova
Monday morning, afternoon, and evening
kucerova@genectr.hunter.cuny.edu

Evan Lee
Wednesday afternoon
elee@genectr.hunter.cuny.edu

Kelvin Ma
Saturday morning and afternoon, Friday morning
Keima536@gmail.com

Kizzy Vazquez
Thursday afternoon
Kv408@hunter.cuny.edu

Ellie Williamson
Friday afternoon
Ellie.williamson@uasdc.org

Exams and Grading:

You will be graded on a score of 500 points. 200 laboratory, 210 lecture, 90 points homework/participation (on MasteringMicrobiology). There will be THREE multiple choice lecture exams at 35 points each. The final is comprehensive and is worth 105 points. There are NO makeup exams for Exams 1,2, or 3. Make-ups for final will only be given in cases of documented emergencies for students with at least a C average from **ALL** other lecture exams. For students that take all 4 exams, a higher final exam grade will replace lower grades for Exams 1, 2, and 3. All students are expected to take all four lecture exams (Exams 1, 2, 3 and Final Exam). Each student should bring #2 pencils, erasers, and valid picture ID for the lecture exam (multiple choice, scantron). Each student will receive lecture exam grades on "My Grades" via Blackboard posted within 10 days following the exam. For distance learning Bb lecture exams, students are expected to be able to log into Bb for duration of the exam given during the assigned lecture time.

The laboratory component is composed of a total of 200 points. Point breakdown will be explained to you in your first lab. Attendance is mandatory for the laboratory section of the course. Attendance will be taken at each laboratory session. You must be on time. It is at the instructors' discretion to mark you late or absent for tardiness. Tardiness or lack of attendance will significantly impact your grade. Up to 10% of your overall lab grade may be deducted for each absence or tardiness in laboratory sections.

Final Grades are determined using the Hunter College grading scale.

Required Reading and Materials:

You are responsible for the material in the text and Modified MasteringMicrobiology (MMB) that correspond to the chapters listed in the syllabus. **You are responsible for checking BlackBoard (BB) regularly.** Lecture slides may not be Posted/Provided; however, the instructor may choose to post review slides on BB. After 4/2, Lecture slides based on the text will be posted on Bb. Blackboard will be utilized to answer questions, post updates, post additional lecture material and post exam grades. You are responsible for material listed on the syllabus for exams following exams and homework. Lecture time is limited/asynchronous and may not cover all the material that will be tested on. You will still be responsible for material that is not covered in lecture but is on the syllabus. If you have specific questions on content, please email the instructor or post a question on Bb Discussion Board.

Modified MasteringMicrobiology is an eText and learning tool for the course. **It will be integrated into Bb meaning you must login through our course in Bb.** At least 90 points (and possible extra credit) for this course are utilized in Modified MasteringMicrobiology. The student is responsible for registering him/herself with their full registered Hunter College name at the start of the semester. This is the only way that we will be able to identify you so be sure that your name matches your CUNY Hunter College registered name. Each assignment is worth an assigned point value (regardless of what is stated on the site) for a total of at least 90 points. Please complete the homework at least one week prior to each exam. Due dates will be posted on MMB. There is absolutely no make-ups/no credit for missed or tardy submissions.

Suggested Reading:

Your Modified MasteringMicrobiology also comes with an eText and very helpful animations and self-test/study assessment opportunities. Reviewing these materials is a good way to help reinforce course content and study for the course. Please be sure to review/complete the study questions at the end of every chapter. These study questions may be on the exam.

Academic Integrity:

A strict code of academic honesty will be followed. Any sign of cheating or plagiarism will result in an automatic ZERO for that test, quiz, or assignment- no exceptions. Cheating and plagiarism include copying from another student's work (current or former) or "copy and pasting" information from the internet. Instructors may use tools such as TurnItIn to verify plagiarism.

"Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining an unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures."

Campus Policy in Compliance with the American Disabilities Act

All students with disabilities and medical conditions are encouraged to register with the Office of AccessABILITY for assistance and accommodation. For information and an appointment contact the Office of AccessABILITY located in Room E1214, or call 212-772-4857/or VP646-755- 3129

*Responsible for understanding chemistry in Chapters 2, 5, 8 and Appendix A

Lecture	Date	Topic (subject to change at instructor's discretion)	Chapter(s)
1	Jan 29	Overview; Introduction	1, 3, (responsible for 2)
2	Feb 5	Prokaryotes; Eukaryotes; Metabolism	4, 5
	Feb 12	College closed	
3	Feb 19	EXAM 1 Microbial Growth and Control	Exam starts at 9:40am; 6
4	Feb 26	Microbial Growth and Control	6, 7
5	Mar 4	Microbial Genetics and Biotechnology, Foundation Figure in Chapter 2	8
6	Mar 11	Microbial Genetics and Biotechnology	8,9
7	Mar 25	EXAM 2	Exam starts at 9:10am on Bb
8	April 7 (follows Wed schedule)	Classification	10
9	Apr 15	Key Characteristics/Classification: Prokaryotes Key Characteristics / Classification: Fungi, Algae, Protozoa	11, 12
10	Apr 22	Key Characteristics / Classification: Viruses, Viroids	13
11	Apr 29	EXAM 3	Exam starts at 9:10am on Bb
12	May 6	Disease and Epidemiology Microbial Mechanisms of Pathogenicity	14, 15
13	May 13	Immunity: Innate and Adaptive	16, 17
*	May 20	9:00-11:00am FINAL EXAM (comprehensive)	All chapters (1, 3-17)

*Syllabus and Lab Calendar are subject to change. Please look at separate attachment/link for most up-to-date laboratory calendar/syllabus.

This course (BIOL230) follows the 2012 American Society for Microbiology (ASM) general undergraduate curriculum guidelines including:

Concepts and Statements on- Evolution

1.Cells, organelles (e.g., mitochondria and chloroplasts) and all major metabolic pathways evolved from early prokaryotic cells. 2.Mutations and horizontal gene transfer, with the immense variety of microenvironments, have selected for a huge diversity of microorganisms. 3.Human impact on the environment influences the evolution of microorganisms (e.g., emerging diseases and the selection of antibiotic resistance).4.The traditional concept of species is not readily applicable to microbes due to asexual reproduction and the frequent occurrence of horizontal gene transfer. 5.The evolutionary relatedness of organisms is best reflected in phylogenetic trees.

Cell Structure and Function

6.The structure and function of microorganisms have been revealed by the use of microscopy (including bright field, phase contrast, fluorescent, and electron).7.Bacteria have unique cell structures that can be targets for antibiotics, immunity and phage infection. 8.Bacteria and Archaea have specialized structures (e.g., flagella, endospores, and pili) that often confer critical capabilities.9.While microscopic eukaryotes (for example, fungi, protozoa and algae) carry out some of the same processes as bacteria, many of the cellular properties are fundamentally different.10.The replication cycles of viruses (lytic and lysogenic) differ among viruses and are determined by their unique structures and genomes.

Metabolic Pathways

11.Bacteria and Archaea exhibit extensive, and often unique, metabolic diversity (e.g., nitrogen fixation, methane production, anoxygenic photosynthesis).12.The interactions of microorganisms among themselves and with their environment are determined by their metabolic abilities (e.g., quorum sensing, oxygen consumption, nitrogen transformations).13.The survival and growth of any microorganism in a given environment depends on its metabolic characteristics.14.The growth of microorganisms can be controlled by physical, chemical, mechanical, or biological means.

Information Flow and Genetics

15.Genetic variations can impact microbial functions (e.g., in biofilm formation, pathogenicity and drug resistance).16.Although the central dogma is universal in all cells,the processes of replication, transcription, and translation differ in Bacteria, Archaea, and Eukaryotes.The regulation of gene expression is influenced by external and internal molecular cues and/or signals 18.The synthesis of viral genetic material and proteins is dependent on host cells.19.Cell genomes can be manipulated to alter cell function.

Microbial Systems

20.Microorganisms are ubiquitous and live in diverse and dynamic ecosystems.21.Most bacteria in nature live in biofilm communities.22.Microorganisms and their environment interact with and modify each other.23.Microorganisms, cellular and viral, can interact with both human and nonhuman hosts in beneficial, neutral or detrimental ways.

Competencies and Skills

Scientific Thinking

Ability to apply the process of science. Demonstrate an ability to formulate hypotheses and design experiments based on the scientific method. Analyze and interpret results from a variety of microbiological methods and apply these methods to analogous situations.

Ability to use quantitative reasoning a.Use mathematical reasoning and graphing skills to solve problems in microbiology.

Ability to communicate and collaborate with other disciplines a. Effectively communicate fundamental concepts of microbiology in written and oral format. b. Identify credible scientific sources and interpret and evaluate the information therein.

Ability to understand the relationship between science and society a. Identify and discuss ethical issues in microbiology.

Microbiology Laboratory Skills

Properly prepare and view specimens for examination using microscopy (bright field and, if possible, phase contrast).

Use pure culture and selective techniques to enrich for and isolate microorganisms.

Use appropriate methods to identify microorganisms (media-based, molecular and serological).

Estimate the number of microorganisms in a sample (using, for example, direct count, viable plate count, and spectrophotometric methods).

Use appropriate microbiological and molecular lab equipment and methods.

Practice safe microbiology, using appropriate protective and emergency procedures.

Document and report on experimental protocols, results and conclusions.