

GRAYSON COLLEGE

Please Note: Due to extenuating circumstances, including public health issues, course and testing delivery methods, instructional schedules, housing contracts, campus procedures and/or operating hours may be altered, interrupted and/or ceased for a limited or extended period of time. Such changes will be posted on the College website.

Course Information

Course: Biol 2320 Microbiology lecture for non-science majors

Section: _____

Delivery: Internet, testing to be conducted online through Canvas

Semester: _____

This course uses free Open Educational Resources so there is no textbook cost

Professor Contact Information

Instructor/Professor: _____

Science Department Phone: 903-463-8797

e-mail: _____

Office Phone: _____

Office Location: _____

Office Hours: _____

Due to the online nature of this course, communication will principally be through email and through Canvas.

Course Pre-requisites, Co-requisites, and/or Other Restrictions

(including required prior knowledge or skills)

Co-requisite: BIOL 2120. Pre-requisites: Successful completion with a grade of C or better in BIOL 2301/2101, CHEM 1406 or CHEM 1311/1111 or consent of the Science Chair required. College readiness in reading required. (R)

Course Description

BIOL 2320. Microbiology (3-0-3). This course covers basic microbiology and immunology and is primarily directed at pre-nursing, pre-allied health, and non-science majors. It provides an introduction to historical concepts of the nature of microorganisms, microbial diversity, the importance of microorganisms and acellular agents in the biosphere, and their roles in human and animal diseases. Major topics include bacterial structure as well as growth, physiology, genetics, and biochemistry of microorganisms. Emphasis is on medical microbiology, infectious diseases, and public health.

Student Learning Outcomes

State Core Objectives Met in this Combined Lecture and Lab Course:

1. Communication Skills, CS1 – Students will develop, interpret, and express ideas through written communication.
2. Critical Thinking Skills, CT2 – Gather and assess information relevant to a question.
3. Critical Thinking Skills, CT3 – Analyze, Evaluate, and Synthesize Information.
4. Empirical and Quantitative Skills, EQS2 – Students will describe, explain, and predict natural phenomena using the scientific method.
5. Teamwork, TW1 – Students will work cooperatively with their peers and leaders to more effectively solve problems by utilizing insights from multiple perspectives.

State Learning Outcomes Met in this Combined Lecture and Lab Course:

Lab component

Upon successful completion of this course, students will:

1. Use and comply with laboratory safety rules, procedures, and universal precautions.
2. Demonstrate proficient use of a compound light microscope.
3. Describe and prepare widely used stains and wet mounts, and discuss their significance in identification of microorganisms.
4. Perform basic microbiology procedures using aseptic techniques for transfer, isolation and observation of commonly encountered, clinically significant bacteria.
5. Use different types of bacterial culture media to grow, isolate, and identify microorganisms.
6. Perform basic bacterial identification procedures using biochemical tests.
7. Estimate the number of microorganisms in a sample using methods such as direct counts, viable plate counts, or spectrophotometric measurements.
8. Demonstrate basic identification protocols based on microscopic morphology of some common fungi and parasites.

Lecture component

Upon successful completion of this course, students will:

1. Describe distinctive characteristics and diverse growth requirements of prokaryotic organisms compared to eukaryotic organisms.
2. Provide examples of the impact of microorganisms on agriculture, environment, ecosystem, energy, and human health, including biofilms.
3. Distinguish between mechanisms of physical and chemical agents to control microbial populations.
4. Explain the unique characteristics of bacterial metabolism and bacterial genetics.
5. Describe evidence for the evolution of cells, organelles, and major metabolic pathways from early prokaryotes and how phylogenetic trees reflect evolutionary relationships.
6. Compare characteristics and replication of acellular infectious agents (viruses and prions) with characteristics and reproduction of cellular infectious agents (prokaryotes and eukaryotes).
7. Describe functions of host defenses and the immune system in combating infectious diseases and explain how immunizations protect against specific diseases.
8. Explain transmission and virulence mechanisms of cellular and acellular infectious agents.

Student Learning Outcomes

Student learning outcomes which will be addressed in laboratory and/or lecture:

1. Students will demonstrate an understanding of factors that lead to microbial antibiotic resistance, as well as techniques for detecting resistance, and assess the effects of such resistance on society.
2. Students will identify examples of harmful as well as beneficial actions of microorganisms, and extrapolate their effects on society.
3. Students will demonstrate critical thinking, problem solving, and decision making while identifying of bacteria in a culture.

Required Textbooks and Materials

Openstax Microbiology Textbook (ISBN-13: 978-1-947172-23-4), Download for free at: <https://openstax.org/details/books/microbiology>

Required Assignments & Academic Calendar

In case of inclement weather, emergency closings, or other unforeseen disruptions to scheduled classes, student must log onto their Canvas accounts for directions on where or how to continue their coursework.

Important Dates:

Course Sequence (Instructors – adjust this sequence to match your course, and add dates as applicable)

Dates and sequence of topics are subject to change. Changes will be announced in Canvas in a timely manner.

Chapter 1 An Invisible World

Chapter 3 The Cell

Chapter 4 Prokaryotic Diversity

Chapter 5 The Eukaryotes of Microbiology

Chapter 6 Acellular Pathogens

Exam over chapters 1, 3, 4, 5, and 6.

Chapter 8 Microbial Metabolism

Chapter 9 Microbial Growth

Chapter 10 Biochemistry of the Genome

Chapter 11 Mechanisms of Microbial Genetics

Exam over chapters 8, 9, 10, and 11

Chapter 13 Control of Microbial Control

Chapter 14 Antimicrobial Drugs

Chapter 15 Microbial Mechanisms of Pathogenicity

Chapter 16 Disease and Epidemiology

Chapter 17 Innate Nonspecific Host Defenses

Chapter 18 Adaptive Specific Host Defenses

Exam over chapters 13, 14, 15, 16, 17, and 18

Bacterial pathogens (various chapters)

- Gram Positive and Gram Negative Cocci
- Gram Positive Bacilli
- Gram Negative Bacilli
- Miscellaneous Bacteria

Exam over Bacterial Pathogens

Eukaryotic and Viral Pathogens (various chapters)

- Fungi
- Protozoans
- DNA Viruses
- RNA Viruses

Final exam over Eukaryotic and Viral Pathogens

Methods of Evaluation)

Grading

Five major examinations (20% each, including the final exam) will be given at scheduled times throughout the semester. There will be no make-ups taken after an exam has been returned to the students. Students not taking the exam will receive a grade of "0". Exams may be taken early as scheduled with the instructor for special circumstances. The student may take a comprehensive exam immediately after taking the final exam to replace a "0" from a missed exam. Exams may consist of multiple choice, matching, short answer, fill-in the-blank, true and false and/or discussion questions. Graded exams will be reviewed in class. After the student examines the test, it will be returned to the instructor.

Special projects may be assigned from time to time. Daily quizzes may be given to enhance the learning process. A student may have the ability to earn up to ten extra credit points during the semester. The extra credit points will be added to the total number of points earned by taking the five exams before dividing by five to derive the course average.

Grading

Due to the combined course format lab and lecture will be combined to produce a single grade. The combined grade is calculated by scoring the lab and lecture as described in their individual syllabi. Those grades will then be weighted with the lecture accounting for 60% of the student's final grade and the lab 40%.

Averages will be rounded up or down. For example, an 89.5 will be rounded up to a 90 and 89.4 will be rounded down to an 89.

Letter grades will be assigned as follows:

89.5 - 100 = A

79.5 - 89.4 = B

69.5 - 79.4 = C

59.5 - 69.4 = D

0 - 59.5 = F

Methods of Instruction

Pre-recorded lectures by the instructor will be the main method of instruction. Group work, class discussions, power point presentations, etc., may also be incorporated to enhance the learning process.

Computer Hardware and Software Requirements

Due to the online format of this course, a computer with a stable, high-speed internet connection is required. Students must be proficient in the use of a computer. The web browser Google Chrome is recommended for accessing course materials.

Grayson College now offers the full Office suite for current students, faculty, and staff for FREE. Simply login to gcidentity.grayson.edu and click on the "Office 365" icon.

In the event of technical difficulties accessing course materials, or taking assessments, contact your instructor as soon as possible.

Class Attendance and Participation

Attendance and Participation Academic success is closely associated with regular class attendance and course participation. All successful students, whether on campus or online, are expected to be highly self-motivated. All students are required to participate in courses regularly and are obliged to participate in class activities and complete and submit assignments following their faculty's instructions. Students taking courses during compressed semester timeframes such as mini-mester, summer sessions, and 8-week courses should plan to spend significantly more time per week on the course. Responsibility for work missed because of illness or school business is placed upon the student. Instructors are required to include in their syllabi the attendance policy for the course(s) they teach. The college considers absences equal to or greater than 15% of the course's requirements to be excessive.

In order for students to be counted as having attended a class before the census date, the following guidelines are to be used: • Physical attendance in class with an opportunity for instructor and student interaction • Submission of an academic assignment • Completion of an exam, interactive tutorial, or computer-assisted instruction • Attendance at a study group assigned by the faculty • Participation in an online discussion in the class • Contact with a faculty member to ask a question

Student Conduct & Discipline

Online Course Conduct (Instructors – adjust this section as necessary to fit your course).

Students are expected to access the course, through Canvas, on a regular basis each week during the semester. It is the student's responsibility to access course learning resources and complete assessments in a timely fashion.

Students are expected to be civil and polite with fellow students and instructors at all times in an online course. Students will refrain from posting inflammatory, obscene, illegal or disrespectful content.

Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, and the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the college's policy on plagiarism (see GC Student Handbook for details). Grayson College subscribes to turnitin.com, which allows faculty to search the web and identify plagiarized material.

Plagiarism is a form of scholastic dishonesty involving the theft of or fraudulent representation of someone else's ideas or words as the student's original work. Plagiarism can be intentional/deliberate or unintentional/accidental. Unintentional/Accidental plagiarism may include minor instances where an attempt to acknowledge the source exists but is incorrect or insufficient. Deliberate/Intentional plagiarism violates a student's academic integrity and exists in the following forms:

- Turning in someone else's work as the student's own (such as buying a paper and submitting it, exchanging papers or collaborating on a paper with someone else without permission, or paying someone else to write or translate a paper)
- Recycling in whole or in part previously submitted or published work or concurrently submitting the same written work where the expectation for current original work exists, including agreeing to write or sell one's own work to someone else
- Quoting or copy/pasting phrases of three words or more from someone else without citation, • Paraphrasing ideas without citation or paraphrasing incompletely, with or without correct citation, where the material too closely matches the wording or structure of the original
- Submitting an assignment with a majority of quoted or paraphrased material from other sources
- Copying images or media and inserting them into a presentation or video without citation,
- Using copyrighted soundtracks or video and inserting them into a presentation or video without citation
- Giving incorrect or nonexistent source information or inventing source information
- Performing a copyrighted piece of music in a public setting without permission
- Composing music based heavily on someone else's musical composition.

Finish with actions or penalties for plagiarism for your course. (and use of Turn-it-in)

Student Responsibility

You have already made the decision to go to college; now the follow-up decisions on whether to commit to doing the work could very well determine whether you end up working at a good paying job in a field you enjoy or working at minimum wage for the rest of your life. Education involves a partnership that requires both students and instructors to do their parts. By entering into this partnership, you have a responsibility to show up for class, do the assignments and reading, be engaged and pay attention in class, follow directions, and put your best effort into it. You will get out of your experience here exactly what you put into it – nothing more and nothing less.

TITLE IX

GC policy prohibits discrimination on the basis of age, ancestry, color, disability, gender identity, genetic information, national origin, race, religion, retaliation, serious medical condition, sex, sexual orientation, spousal affiliation and protected veterans

status.

Furthermore, Title IX prohibits sex discrimination to include sexual misconduct: sexual violence (sexual assault, rape), sexual harassment and retaliation.

For more information on Title IX, please contact:

- Dr. Molly M. Harris, Title IX Coordinator (903)463-8714
 - Ms. Logan Maxwell, Title IX Deputy Coordinator - South Campus (903) 415-2646
 - Mr. Mike McBrayer, Title IX Deputy Coordinator - Main Campus (903) 463-8753
 - Website: <http://www.grayson.edu/campus-life/campus-police/title-ix-policies.html>
 - GC Police Department: (903) 463-8777- Main Campus) (903-415-2501 - South Campus)
 - GC Counseling Center: (903) 463-8730
 - For Any On-campus Emergencies: 911
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**Grayson College is not responsible for illness/injury that occurs during the normal course of classroom/lab/clinical experiences.

**These descriptions and timelines are subject to change at the discretion of the Professor.

** Grayson College campus-wide student policies may be found at the following URL on the College website: <https://www.grayson.edu/currentstudents/Academic%20Resources/index.html>