



INSTRUCTIONAL PACKAGE

BIO 225
Microbiology

Effective Term
Fall 2025/Spring 2026/Summer 2026

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Part I: Course Information

Effective Term: Fall 2025/Spring 2026/Summer 2026

COURSE PREFIX: BIO 225

COURSE TITLE: Microbiology

CONTACT HOURS: 3-3

CREDIT HOURS: 4

RATIONALE FOR THE COURSE:

BIO 225 provides students an increased awareness of the potential for infectious transmission of various microbes and an understanding of the ways in which such transmissions can be prevented. Through guided classroom and laboratory experiences, students will be developing skills in the use of sterilization procedures, studying general microbes, their disease producing capabilities, their habitats, treatments, and preventions of various microbial infections. Understanding these concepts is key in the allied health fields requiring students to apply these principles in preventing disease transmission among patients.

COURSE DESCRIPTION:

This is a detailed study of microbiology as it relates to infection and the disease processes of the body. Topics include immunity, epidemiology, medically important microorganisms, and diagnostic procedures for identification. This course is transferable to public senior institutions as part of the South Carolina Commission on Higher Education Statewide Articulation Agreement.

PREREQUISITES/CO-REQUISITES:

Credit level [BIO 102](#) Minimum Grade of C or Credit level [BIO 211](#) Minimum Grade of C or Credit level [BIO 102](#) Minimum Grade of TC or Credit level [BIO 211](#) Minimum Grade of TC

REQUIRED MATERIALS:

Please visit the [BOOKSTORE](#) online site for most current textbook information.

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

ADDITIONAL REQUIREMENTS:

For Hybrid/Online Students Only: Each student will be required to view an orientation PowerPoint presentation during the first week of class. This presentation can be found on the course homepage in D2L under News. After viewing the presentation, all online students must

complete the orientation quiz, which can be found under the dropdown assignment menu. A student will not be considered officially enrolled in the course until the presentation has been viewed and the quiz completed with a 100% score. Any submitted work from the student including discussion posts, assignments, etc. will not be given a grade until the presentation has been viewed and the quiz has been submitted.

TECHNICAL REQUIREMENTS:

Access to Desire2Learn (D2L), HGTC's learning management system (LMS) used for course materials.

Access to myHGTC portal for student self-services.

College email access – this is the college's primary official form of communication.

STUDENT IDENTIFICATION VERIFICATION

Students enrolled in online courses will be required to complete identity verification. Please refer to your Instructor Information Sheet for information regarding this requirement.

CLASSROOM ETIQUETTE:

As a matter of courtesy to other students and your professor, please turn off cell phones and other communication/entertainment devices before class begins. If you are monitoring for an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

NETIQUETTE: is the term commonly used to refer to conventions adopted by Internet users on the web, mailing lists, public forums, and in live chat focused on online communications etiquette. For more information regarding Netiquette expectations for distance learning courses, please visit [Online Netiquette](#).

ACADEMIC DISHONESTY:

All forms of academic dishonesty, as outlined in the Student Code in the HGTC catalog, will NOT be tolerated and will result in disciplinary action. Anyone caught cheating (Defined in the code as: "a. Copying from another student's test or answer sheet. b. Using materials or equipment during a test not authorized by the person giving the test. c. Collaborating with any other person during a test without permission. d. Knowingly obtaining, using, buying, selling, transporting, or soliciting in whole or in part the contents of a test prior to its administration. e. Bribing or coercing any other person to obtain tests or information about tests. f. Substituting for another student or permitting any other person to substitute for oneself. g. Cooperating or aiding in any of the above.") or committing plagiarism (Defined in the code as: "(1) the appropriation of any other person's work and the unacknowledged incorporation of that work in one's own work or (2) submitting content for academic purposes that are created by artificial intelligence, technology platforms, or writing services and representing that such content is the person's own work product.") will be given a grade of a zero for that assignment and reported to the Senior VP of Academic Affairs, in accordance with the student handbook. If a zero is awarded due to academic misconduct and the lowest exam grade is dropped, that zero will

NOT be eligible to be the dropped grade, it will count within the final average. A second offense will result in the student being withdrawn from the course with a W and charges being filed with the Chief Student Services Officer. Alternatively, at the professor's discretion, a student can be assigned a failing grade for the course.

Part II: Student Learning Outcomes

COURSE LEARNING OUTCOMES and ASSESSMENTS*:

Lecture Student Learning Outcomes:

Module 1: Fundamentals of Microbiology

Upon successful completion of the course, the student will be able to:

- Identify individuals and their contributions to the field of microbiology.
- Assess the various theories in microbiology formulated during the "Golden Age of Microbiology."
- Identify all branches of microbes in their Domains and Kingdoms.
- Differentiate between types of microorganisms.
- Explain basic microbiology laboratory procedures.
- Differentiate between types of growth media.
- Describe the principles of microscopy.
- Identify various staining techniques.

Module 2: Microorganisms

Upon successful completion of the course, the student will be able to:

- Analyze the structures of a prokaryotic cell and compare the similarities and differences with the eukaryotic cell structure.
- Identify medically relevant bacteria, fungi, algae, and protozoa and explain their impact on the medical field.
- Examine characteristics of the different phyla of fungi, algae, protozoa, and multicellular parasites.
- Identify various fungi, algae, protozoa, and multicellular parasites as viewed under a microscope.
- Classify the major groups of viruses according to their capsid structure and morphology.
- Explain the stages of the virus replication cycle.
- Predict the effects of a viral infection on an animal host cell.

Module 3: Growth and Control

Upon successful completion of the course, the student will be able to:

- Analyze various physical and chemical conditions required for the growth of microbes, including temperature, pH, oxygen, and osmotic pressure requirements.
- Identify various physical and chemical agents used to control the growth of microbes, including heat, desiccation, radiation, etc., and their impact on microorganisms.
- Classify antibiotics based on their mechanism of action against bacterial targets.
- Discuss the emergence of antibiotic resistance.
- Differentiate between DNA and RNA.
- Explain the process of replication, transcription, and translation related to microbial genetics, and differentiate between prokaryotic and eukaryotic processes.
- Discuss ways in which recombinant DNA is beneficial.

Module 4: Interactions between Microbes and Their Host

Upon successful completion of the course, the student will be able to:

- Define terms such as normal flora (i.e., normal biota), commensalism, mutualism, parasitism, epidemiology, pathogen, etiology, infection, microbial antagonism, disease, etc.
- Analyze the role of the body's first, second, and third lines of defense against microorganisms.
- Discuss the specific roles of phagocytes, fever, inflammation, and certain chemical agents (e.g., complement and interferon) as nonspecific defenses of the host.
- Explain the role of B and T lymphocytes in acquired immunity (i.e., adaptive immunity).
- Differentiate between humoral and cell-mediated immunity.
- Describe the roles of antigens and antibodies.

Module 5: Microbial Diseases

Upon successful completion of the course, the student will be able to:

- Identify and differentiate between microbial pathogens responsible for infectious diseases across various organ systems (e.g., integumentary, nervous, cardiovascular, lymphatic, respiratory, and digestive systems).
- Explain the transmission of infectious agents, including direct contact, airborne, vector-borne, foodborne, waterborne, and nosocomial routes.
- Analyze the pathogenesis of infectious diseases, including the molecular mechanisms underlying microbial virulence, host susceptibility factors, and the immune response to infection.

- Evaluate the clinical manifestations, diagnostic methods, and treatment options for common infectious diseases across different organ systems, considering antimicrobial therapy, supportive care, and immunization strategies.
- Discuss emerging infectious diseases, including factors contributing to their emergence, global spread, and the role of interdisciplinary collaboration in responding to new infectious threats.

Lab Student Learning Outcomes:

Upon successful completion of the course, the student will be able to:

- Demonstrate safe practices in a microbiology laboratory.
- Practice aseptic techniques, handle specimens, reagents, and other testing materials, and maintain a sterile work area.
- Illustrate proficiency in inoculation techniques (e.g., streak plate isolation).
- Demonstrate proper usage and identify the parts/function of a compound light microscope.
- Prepare microscope slides.
- Explain simple and differential staining techniques and corresponding microscopic bacterial characteristics.
- Identify strategies employed by various antibiotics and how they target microorganisms and apply this understanding to antimicrobial treatment and drug resistance.
- Perform serial dilutions and apply them to quantify bacteriophage concentration using the plaque assay technique.
- Understand the purpose and principles associated with biochemical test media in determining the metabolic characteristics of bacteria.
- Analyze results from various microbiological tests to identify an unknown bacterial species.
- Create an artifact to communicate the results of a scientific experiment.

****Students – please refer to the Instructor’s Course Information sheet for specific information on assessments and due dates.***

Part III: Grading and Assessment

EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS*

Students' performance will be assessed, and the weight associated with the various measures/artifacts are listed below.

EVALUATION*

Lecture	75%
Lab	25%
	100%

****Students, for the specific number and type of evaluations, please refer to the Instructor's Course Information Sheet.***

GRADING SYSTEM:

Please note the College adheres to a 10-point grading scale A = 100 – 90, B = 89- 80, C = 79 – 70, D = 69 – 60, F = 59 and below.

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. D's, F's, W's, WF's and I's also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the [academic calendar](#) for deadlines for add/drop. You must attend at least one meeting of all of your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of 80 percent (80%) of their classes in order to receive credit for any course. Due to the varied nature of courses taught at the college, some faculty may require up to 90 percent (90%) attendance. Pursuant to 34 Code of Federal Regulations 228.22 - Return to Title IV Funds, once a student has missed over 20% of the course or has missed two (2) consecutive weeks, the faculty is obligated to withdraw the student and a student may not be permitted to reenroll. **Instructors define absentee limits for their class at the beginning of each term; please refer to the Instructor Course Information Sheet.**

For online and hybrid courses, check your Instructor's Course Information Sheet for any required on-site meeting times. Please note, instructors may require tests to be taken at

approved testing sites, if you use a testing center other than those provided by HGTC, the center may charge a fee for its services.

Science Department Attendance Policies:

For a 15-week course (fall and spring) or a 10-week course (summer), the allowed number of absences for a MW or TR class is as follows: 4 absences are allowed for lecture and 2 are allowed for lab, regardless of reason. For a lecture class that meets once a week, the allowed number of absences is 2.

For a 7-week fast-paced course (fall and spring) or a 5-week fast-paced course (summer), the allowed number of absences is as follows: 1 absence is allowed for lecture and 1 for lab, regardless of reason.

Online/Hybrid Attendance:

Students enrolled in distance learning courses (hybrid and online) are required to maintain contact with the instructor on a regular basis to be counted as "in attendance" for the course. All distance learning students must participate weekly in both an online lecture and lab attendance activity in order to demonstrate course participation. Students showing no activity in the course for two weeks in either the lecture or lab component (these weeks do not need to be consecutive) will be withdrawn due to lack of attendance.

Lab Attendance for Hybrid Courses:

Students in hybrid classes in which labs only meet 5 or 6 times during the semester, must attend all lab sessions for its entirety. Failure to attend one lab will result in immediate withdrawal. Students in hybrid classes where labs meet every week, you are allowed two lab absences. When a student surpasses the allowed number of absences, the student will be dropped automatically from the course with a W or a WF.

Lab Attendance for Hybrid Courses:

Students in hybrid classes in which labs meet weekly, are allowed two (2) lab absences. Students in hybrid labs that only meet 5 or 6 times during the semester, must attend all lab sessions for its entirety. When a student surpasses the allowed number of absences, the student will be dropped automatically from the course with a W or a WF.

Tardiness:

Students are expected to arrive on time and remain for the entire class session. Repetitive tardiness that results in a significant loss of instructional time may be counted as an absence at the instructor's discretion. Students are encouraged to communicate with their instructor in advance if they anticipate being late or need to leave early due to extenuating circumstances.

Part V: Student Resources



THE STUDENT SUCCESS AND TUTORING CENTER (SSTC):

The SSTC offers to all students the following **free** resources:

1. Academic tutors for most subject areas, Writing Center support, and Academic Coaching for college success skills.
2. Online tutoring and academic support resources.
3. Professional and interpersonal communication coaching in the EPIC Labs.

Visit the [Student Success & Tutoring Center](#) website for more information. To schedule tutoring or coaching, contact the SSTC at ssc@hgtc.edu or self-schedule in the Penji iOS/Android app or at www.penjiapp.com. Email ssc@hgtc.edu or call SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455, or go to the SSTC [Online Resource Center](#) to access on-demand resources.



STUDENT INFORMATION CENTER: TECH Central

TECH Central offers to all students the following **free** resources:

1. Getting around HGTC: General information and guidance for enrollment, financial aid, registration, and payment plan support!
2. In-person and remote assistance are available for Desire2Learn, Student Portal, Degree Works, and Office 365.
3. Chat with our staff on TECH Talk, our live chat service. TECH Talk can be accessed on the student portal and on TECH Central's website, or by texting questions to (843) 375-8552. Visit the Tech Central website for more information. Live Chat and Center locations are posted on the website. Or please call (843) 349 – TECH (8324), Option # 1.



HGTC LIBRARY:

Each campus location has a library where HGTC students, faculty, and staff may check out materials with their HGTC ID. All three HGTC campus libraries have librarians and staff who can aid with research, computers to support academic research and related school-work, and individual/group study rooms. Printing is available as well at each location. Visit the [Library](#)

website for more information or call (843) 349-5268.

STUDENT TESTING:

Testing in an **online/hybrid** course and in **make-up exam** situations may be accomplished in a variety of ways:

- Test administered within D2L.
- Test administered in writing on paper.
- Test administered through Publisher Platforms (which may have a fee associated with the usage)

Furthermore, tests may have time limits and/or require a proctor.

Testing candidates must make their appointments 24 hours in advance.

Students must bring a physical ID in order to take a test.

Proctoring can be accomplished either face-to-face at an approved site or online through our online proctoring service. To find out more about proctoring services, please visit the [Online Testing](#) section of the HGTC's Testing Center webpage.

The **Instructor Information Sheet** will have more details on test requirements for your course.

DISABILITY SERVICES:

HGTC is committed to providing an accessible environment for students with disabilities.

Students seeking accommodations are encouraged to visit HGTC's [Accessibility and Disability Service webpage](#) for detailed information.

It is the student's responsibility to self-identify as needing accommodations and to provide appropriate documentation. Once documentation is submitted, the student will participate in an interactive process with Accessibility and Disability Services staff to determine reasonable accommodations. Students may begin the accommodations process at any time; however, accommodations are **not retroactive** and will only be applied from the point at which they are approved. Students must contact the office **each semester** to renew their accommodations.

For assistance, please contact the Accessibility and Disability Services team at disabilityservices@hgtc.edu or 843-796-8818 (call or text).

COUNSELING SERVICES:

HGTC Counseling Services strives to optimize student success through managing personal and academic concerns that may interfere with achieving educational goals. Staff are available to every student for assistance and guidance on personal matters, academic concerns and other

areas of concern. HGTC offers free in-person and telehealth counseling services to students. For more information about counseling services, please reach out to counseling@hgtc.edu or visit the website the [Counseling Services webpage](#).

STATEMENT OF EQUAL OPPORTUNITY/NON-DISCRIMINATION STATEMENT:

Our sincere commitment to both effective business management and equitable treatment of our employees requires that we present this Policy Statement as an embodiment of that commitment to the fullest.

Discrimination is conduct that includes unjust or prejudicial treatment based upon an individual's sex, race/color, religion, national origin, age, disability, service in the uniformed services (as defined in state and federal law), veteran status, political ideas, marital or family status, pregnancy, childbirth, or related medical conditions, including, but not limited to, lactation, genetic information, genetic identity, gender expression, or sexual orientation that excludes an individual from participation in, denies the individual the benefits of, treats the individual differently, or otherwise adversely affects a term or condition of a person's working or learning environment. This includes failing to provide reasonable accommodation, consistent with state and federal law, to persons with disabilities.

INQUIRIES REGARDING THE NON-DISCRIMINATION/TITLE IX POLICIES:

Student and prospective student inquiries concerning Section 504, Title II, Title VII, and Title IX and their application to the College or any student decision may be directed to the Vice President for Student Affairs.

Dr. Melissa Batten, VP Student Affairs

Title IX, Section 504, and Title II Coordinator
Building 1100, Room 107A, Conway Campus
PO Box 261966, Conway, SC 29528-6066
843-349-5228
Melissa.Batten@hgtc.edu

Employee and applicant inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Vice President for Human Resources.

Jacquelyne Snyder, VP Human Resources

Affirmative Action/Equal Opportunity Officer and Title IX Coordinator
Building 200, Room 205B, Conway Campus
PO Box 261966, Conway, SC 29528-6066
843-349-5212
Jacquelyne.Snyder@hgtc.edu

TITLE IX REQUIREMENTS:

Title IX of the Education Amendments of 1972 protects students, employees, applicants for admission and employment, and other persons from all forms of sex discrimination.

HGTC prohibits the offenses of domestic violence, dating violence, sexual assault, and stalking and will provide students, faculty, and staff with necessary information regarding prevention, policies, procedures, and resources.

Any student, or other member of the college community, who believes that they have been a victim of sexual harassment, domestic violence, dating violence, sexual assault, or stalking may file a report with the college's Title IX Coordinator or campus law enforcement*.

*Faculty and Staff are required to report these incidents to the Title IX Coordinator when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

Student and prospective student inquiries concerning Title IX and its application to the College or any student decision may be directed to the Vice President for Student Affairs.

Dr. Melissa Batten, VP Student Affairs

Title IX, Section 504, and Title II Coordinator
Building 1100, Room 107A, Conway Campus
PO Box 261966, Conway, SC 29528-6066
843-349-5228
Melissa.Batten@hgtc.edu

Employee and applicant inquiries concerning Title IX and its application to the College may be directed to the Vice President for Human Resources.

Jacquelyne Snyder, VP Human Resources

Affirmative Action/Equal Opportunity Officer and Title IX Coordinator
Building 200, Room 205B, Conway Campus
PO Box 261966, Conway, SC 29528-6066
843-349-5212
Jacquelyne.Snyder@hgtc.edu

PREGNANCY ACCOMMODATIONS

Under Title IX, colleges must not exclude a pregnant student from participating in any part of an educational program. Horry-Georgetown Technical College is committed to ensuring that pregnant students receive reasonable accommodations to ensure access to our educational programs.

Students should advise the Title IX Coordinator of a potential need for accommodations as soon

as they know they are pregnant. It is extremely important that communication between student, instructors, and the Title IX Coordinator begin as soon as possible. Each situation is unique and will be addressed individually.

Title IX accommodations DO NOT apply to Financial Aid. Financial Aid regulations do not give the College any discretion in terms of Financial Aid eligibility.

Certain educational programs may have strict certification requirements or requirements mandated by outside regulatory agencies. Therefore, in some programs, the application of Title IX accommodations may be limited.

To request pregnancy accommodations, please complete the *Pregnancy Intake Form* that can be found [here](#).