



INSTRUCTIONAL PACKAGE

BIO 105
Principles of Biology

Effective Term

Fall 2024/Spring 2025/Summer 2025

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Part I: Course Information

Effective Term: Fall 2024/Spring 2025/Summer 2025

COURSE PREFIX: BIO 105

COURSE TITLE: Principles of Biology

CONTACT HOURS: 3-3

CREDIT HOURS: 4

RATIONALE FOR THE COURSE:

BIO 105 introduces students to fundamental concepts in Biology and helps relate this information to real-world applications. This course is intended for non-science majors, and through guided classroom and laboratory experiences, students will be developing a deeper appreciation of the biological world.

COURSE DESCRIPTION:

This is an introductory biology course, unifying biology concepts and principles at all levels. This course introduces basic chemistry, cell structure and function, DNA, genetics, evolution, ecology, and animal and plant structure and function.

PREREQUISITES/CO-REQUISITES:

***Online/Hybrid** courses require students to complete the [Distance Learning Orientation Video](#) prior to enrolling in an online course.

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:

A Connect access code from McGraw Hill is a required component of this course.

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. Failure to view the presentation and take the quiz before midnight on the last day to add/drop classes will result in the student being automatically dropped from the course.

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 participate in a minimum of one (1) proctored assignment and/or one (1) virtual event to support student identification 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. A second offense will result in the student being withdrawn from the course with a W or WF at the professor's discretion and charges being filed with the Chief Student Services Officer.

Part II: Student Learning Outcomes**COURSE LEARNING OUTCOMES and ASSESSMENTS*:**

Lecture Student Learning Outcomes:
Chapter 1 The Scientific Study of Life

Describe how science is used to study life.
Describe the characteristics that all living organisms share.
Compare and contrast the three branches of life.

Chapter 2 The Chemistry of Life

Explain the relationship between chemistry and biology.
Identify the most important elements in living organisms.
Describe the structure of atoms.
Compare and contrast the different types of bonds.
Explain how the structure of water affects its chemical properties.
Explain how acids and bases affect pH.

Chapter 3 Cells

Describe the properties of a cell.
Define a cell using the components of cell theory.
Identify the components common to all cells.
Compare and contrast the cells that characterize the three domains of life.
Explain how the chemical structure of phospholipids enables them to form a bilayer in water.
Explain why a biological membrane has selective permeability.
Identify the functions of the organelles in eukaryotic cells.

Chapter 4 The Energy of Life

Describe the energy transfers that are common to life.
Describe how cells use energy to do work.
Compare and contrast potential and kinetic energy.
Explain how enzymes catalyze reactions.
List the factors that influence enzyme activity.
Compare and contrast the ways that molecules move across membranes.
Explain the relationship between diffusion and concentration gradients.

Chapter 5 Photosynthesis

Explain how photosynthetic organisms convert light energy to chemical energy.
Explain the importance of photosynthesis in ecosystems.
Draw and describe the net reaction in photosynthesis.
Explain how light interacts with pigments.
Describe the structures in a leaf that are involved in photosynthesis.
Compare and contrast the light and carbon reactions of photosynthesis.
Explain the relationship between the products and reactants of the light and carbon reactions.

Chapter 6 How Cells Release Energy

Explain how cells use energy in food to produce ATP.
Draw and explain the net reaction in aerobic respiration.
Compare and contrast the events of glycolysis, the Krebs cycle, and the electron transport chain.
Describe where in a eukaryotic cell each step of respiration occurs.
Explain the role of O_2 in respiration.
Calculate the net ATP produced in aerobic respiration.

Compare and contrast aerobic respiration and fermentation.

Chapter 8 DNA Replication and Cell Division

Explain how cells divide to give rise to identical cells.

Identify the roles of mitosis, meiosis, and fertilization in the human life cycle.

Define apoptosis.

Explain what features of DNA allow semiconservative replication to occur.

Describe the events of binary fission in prokaryotic cells.

Explain what happens in a eukaryotic cell at each stage of the cell cycle.

Diagram and identify the phases in mitosis.

Explain how cell cycle checkpoints relate to cancer.

List some of the factors that increase the risk for developing cancer.

Chapter 9 Sexual Reproduction and Meiosis

Explain how genetic information is passed from one generation to the next.

Compare and contrast sexual and asexual reproduction.

Distinguish between autosomes and sex chromosomes.

Explain the roles of meiosis, gamete formation, and fertilization in sexual reproduction.

Differentiate between haploid and diploid cells.

Sketch and identify the steps in meiosis.

Compare and contrast mitosis and meiosis.

Diagram and explain how polyploidy and nondisjunction can lead to missing or extra chromosomes in a gamete.

Chapter 10 Patterns of Inheritance

Explain how genetic traits are passed from one generation to the next.

Describe the role of chromosomes in inheritance.

Explain how meiosis and the production of gametes are associated with inheritance.

Explain the relationship between dominant and recessive alleles of a gene.

Compare and contrast genotype and phenotype.

Differentiate between homozygous and heterozygous.

Use a Punnett square to diagram and explain the inheritance of one gene.

Chapter 13 Evidence of Evolution

List the lines of evidence that support evolutionary theory.

Explain which types of organisms are most likely to appear in the fossil record.

Describe two ways that the age of a fossil can be determined.

Explain how biogeography can be used to explain the evolution of a species.

Compare and contrast homologous, vestigial, and analogous structures.

Chapter 14 Speciation and Extinction

Describe the forces that lead to the evolution of new species.

Compare and contrast microevolution and macroevolution.

Define a biological species.

Compare and contrast allopatric and sympatric speciation.

Compare and contrast gradualism and punctuated equilibrium.

Identify factors that can affect the extinction rate of species.
Name the levels of the taxonomic hierarchy from domain to species.

Chapter 15 The Evolution and Diversity of Microbial Life

Summarize the evidence for the origin of life on Earth.
Describe how conditions on the early Earth could contribute to the production of biological molecules.
Describe the characteristics of prokaryotes.
Identify the features and functions of structures found in prokaryotes.
Compare and contrast archaea with bacteria.
Explain how prokaryotes interact with other organisms.
Diagram and describe how endosymbiosis contributed to the evolution of eukaryotes.
Explain how multicellular eukaryotic organisms may have evolved.
Describe the characteristics common to all fungi.
Explain how fungi interact with other organisms.

Chapter 16 The Evolution and Diversity of Plants

Use an organism's characteristics to classify it into a taxon within kingdom Plantae.
Describe the characteristics common to all plants.
Understand the adaptations of plants to terrestrial habitats.
Explain the interaction of flowers and fruits with animals in angiosperm reproduction.

Chapter 17 The Evolution and Diversity of Animals

Use an organism's characteristics to classify it into a taxon within kingdom Animalia.
Describe the characteristics common to all animals.
Describe the characteristics used to infer the evolutionary relationships among the nine largest phyla of animals.
Describe the four key characteristics of chordates.
Describe the characteristics used to infer the evolutionary relationships among the chordates.
Compare and contrast the characteristics and key adaptations of the main chordate groups.
Describe the diversity and evolutionary history of the chordates.

Chapter 19 Communities and Ecosystems

Explain the interactions in communities and ecosystems.
Distinguish between biotic and abiotic interactions in an ecosystem.
Compare and contrast the main types of interactions between species in a community.
Describe competitive exclusion.
Explain how species interactions can lead to coevolution.
Describe and give examples of the importance of a keystone species.
Explain measures of diversity in biological communities.
Explain the roles of producers, consumers, and decomposers in an ecosystem.

Chapter 20 Preserving Biodiversity

Explain factors that affect biodiversity.
Describe biodiversity and its importance to ecosystems.
Explain how habitat loss contributes to loss of biodiversity.
Explain how climate change can affect biodiversity.

Explain how invasive species can affect biodiversity.
Explain how overexploitation can affect biodiversity.

Lab Student Learning Outcomes:

Learning outcomes for the lab portion of this course are the Objectives given for each lab in the manual and can be found at the start of each lab. They include hands-on items such as identification of lab equipment, models, and specimens on slides, and the use of microscopes and lab equipment. In addition, students will be required to design and carry out scientific investigations, collect data and draw conclusions utilizing the scientific method.

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

General Education Outcomes

This course fulfills the following General Education Outcomes through the Biology in the News presentation. Upon completion of this course, students will be able to:

- Communicate effectively;
- Think critically;
- Self and professional development.

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. Ds, Fs, Ws, WFs and Is 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, and 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.

When a student surpasses the allowed number of absences, the student will be dropped automatically from the course with a W or a WF. Remember, an absence is an absence, no matter if it is excused or not!

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 an Attendance activity in order to demonstrate course participation. Students showing no activity in the course for two weeks (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 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.

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 **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, contact the SSTC at sstc@hgtc.edu or self-schedule in the Penji iOS/Android app or at www.penjiapp.com. Email sstc@hgtc.edu or call SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455, or go to the [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. Use the [Online Resource Center \(ORC\)](#) including Office 365 support, password resets, and username information.
3. **In-person workshops, online tutorials and more services** are available in Desire2Learn, Student Portal, Degree Works, and Office 365.
4. **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 are equipped with computers to support academic research and related schoolwork; printing is available as well. 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.

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. Inquiries may be directed to HGTC's [Accessibility and Disability Service webpage](#). The Accessibility and Disability Services staff will review documentation of the student's disability and, in a confidential setting with the student, engage in an interactive process to develop an educational accommodation plan.

Note: It is the student's responsibility to self-identify as needing accommodations and to provide acceptable documentation. After a student has self-identified and submitted documentation of a disability, accommodations may be determined, accepted, and provided. Students will need to reach out to the Accessibility and Disability Services staff each semester to renew their accommodations.

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:

Horry-Georgetown Technical College shall not discriminate in employment or personnel decisions or in student admissions or in student decisions, or in all other segments of the College community on the basis of race, color, sex, national or ethnic origin, age, religion,

disability, marital or family status, veteran status, political ideas, sexual orientation, gender identity, or pregnancy, childbirth, or related medical conditions, including, but not limited to, lactation, in the educational programs and activities which it operates, and the college is prohibited from discrimination in such manner by applicable laws. Practices and requirements for nondiscrimination extend to the enrollment of students in programs and activities of the College and employment by the College.

All inquiries regarding the federal laws as they relate to discrimination on the basis of sex may be directed to Tamatha Sells, Title IX Coordinator, Horry-Georgetown Technical College, Building 1100C, Room 107B, 2050 Hwy 501 E, PO Box 261966, Conway, SC 29528-6066, 843-349-5218, tamatha.sells@hgtc.edu or to the US Department of Education Office of Civil Rights. (Telephone: 800-421-3481/Email: OCR@ed.gov).

Other employee and applicant inquiries concerning the federal laws and their application to the College may be directed to Jacquelyne Snyder, Vice President, Human Resources and Employee Relations & the College's Affirmative Action/Equal Opportunity Officer, Horry-Georgetown Technical College, Building 200C, Room 205B, 2050 Hwy 501 E, PO Box 261966, Conway, SC 29528-6066, 843-349-5212, jacquelyne.snyder@hgtc.edu.

Other student and prospective student inquiries concerning the federal laws and their application to the College or any student decision may be directed to Dr. Melissa Batten, Vice President, Student Affairs, Section 504 & Title II Coordinator Horry-Georgetown Technical College, Building 1100C, Room 107A, 2050 Hwy 501 E, PO Box 261966, Conway, SC 29528-6066, 843-349-5228, melissa.batten@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).

For more information, contact Tamatha Sells, Title IX Coordinator, Conway Campus, Building 1100C, Room 107B, 843-349-5218, tamatha.sells@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**](#).