



# INSTRUCTIONAL PACKAGE

BIO 105

Principles of Biology

Fall 2018- Summer 2019

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## PART I: COURSE INFORMATION

Effective Term: 2018-2019

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 develop 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 molecules and basic chemistry, cell structure and function, cellular metabolism and cell division as well as DNA structure and function and basic genetics. The course progresses into evolution and ecology and also provides an overview of animal and plant structure and function.

### **PREREQUISITES/CO-REQUISITES:**

(COMPASS Reading 85 and COMPASS Writing 78) or ( ACCUPLACER Reading Comp 075 and ACCUPLACER Sentence Skills 081) or ( New ACCUPLACER Reading Comp 250 and New ACCUPLACER Sentence Skills 250) or ( COMPANION Reading 075 and COMPANION Sentence Skills 081) or SAT Critical Reading 480 or ( ACT Reading 19 and ACT English 19) or Multiple Measures English 1 or Credit level ENG 101 Minimum Grade of C or Credit level ENG 101 Minimum Grade of TC or Credit level ENG 155 Minimum Grade of C or Credit level ENG 155 Minimum Grade of TC or Credit level ENG 100 Minimum Grade of C\*

\* **\*Online/Hybrid** courses require students to complete the DLI Online Student Orientation prior to completing an online course. The DLI Online Student Orientation can be found in WaveNet, under the My Student tab.

### **REQUIRED MATERIALS:**

Please visit the Bookstore online site for most current textbook information. Use the direct link below to find textbooks.

[BOOKSTORE.](#)

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 student portal for course materials.  
WaveNet and D2L email access.

#### **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 or committing plagiarism (Defined in the code as: "The appropriation of any other person's work and the unacknowledged incorporation of that work in one's own work offered for credit") 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 "WF" and charges being filed with the Chief Student Services Officer.

## **Part II: Student Learning Outcomes**

### **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 in respiration occurs.

Explain the role of O<sub>2</sub> 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.

### **Program Learning 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

***\*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.

### **DEPARTMENT OF NATURAL SCIENCES GRADING POLICY**

Your grade for this course will be determined solely on the basis of the criteria outlined below. Students will not be allowed to substitute other activities (reports, homework, etc.) to count in place of any of the stated criteria (this means there will be NO extra credit offered). As the tests/exams given in this course are designed to measure the extent to which you have mastered course materials, students should not expect there to be any "curving" of grades.

### **EVALUATION\***

Lecture	75%
Labs	<u>25%</u>
	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.

Withdrawal before the sixth day of the term is considered a "drop" and will not show on the official transcript. Withdrawal from the sixth day of the term through the two-thirds point of the term results in a grade of "W." Students who withdraw after the two-thirds point will receive either a grade of a "W" (if passing the course at the time of withdrawal), or the course instructor can assign a grade of "WF" (if the student is not passing the course at the time of withdrawal). Students should discuss their withdrawal plans and the grade they will receive with their instructor prior to withdrawal.

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 ([ACADEMIC CALENDAR](#)). 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 eighty percent (80%) of his or her classes in order to be eligible to receive credit for any

course. However, due to the varied nature of courses taught at the College, a more rigid attendance policy may be required by individual instructors. At a minimum, a student may be withdrawn from a course(s) after he or she has been absent in excess of ten percent (10%) of the total contact hours for a course. **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.

#### **Lecture Attendance:**

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

#### **Lab Attendance:**

Students are allowed one (1) lab absence for a lab that meets weekly. When a student surpasses the allowed number of absences, the student will be dropped automatically from the course with a W or a WF.

#### **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 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 **one** lab absence. 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 coaches** for most subject areas, **Writing Center Support**, and **college success skills**.
- 2. On-line student success and academic support resources.**

Visit the SSTC website: [Student Success & Tutoring Center](#) and visit the student services tab in your WaveNet account to schedule appointments using TutorTrac. For more information, call: SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455. Room locations and Live Chat is available on the SSTC website.





## Student Information Center: WaveNet Central (WNC)

WNC offers to all students the following **free** resources:

1. **Getting around HGTC:** General information and guidance for enrollment!
2. Use the [Online Resource Center \(ORC\)](#) for COMPASS support, technology education, and online tools.
3. **Drop-in technology support or scheduled training** in the Center or in class.
4. **In-person workshops, online tutorials and more services** are available.

Visit the WNC website: [Wavenet Central](#). Live Chat and Center locations are posted on the website. Or please call one of the following locations: WNC Conway, 349-5182; WNC Grand Strand, 477-2076; and WNC Georgetown, 520-1473.

**Student Testing:** (If course is offered in multiple format include this section, delete if only F2F sections are offered.)

Testing in an **online/hybrid** course may be accomplished in a variety of ways:

- Test administered within D2L
- Test administered in writing on paper
- Test administered through Publisher Platforms

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 RPNOW, 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 Jocelyn Williams, Director of Student Development on the Conway Campus Jaime Davis, Counselor/Advisor on the Georgetown Campus or Kristin Griffin, Counselor on the Grand Strand Campus. These individuals will review documentation of the student's disability and, in a confidential setting with the student, 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.

## Statement of Equal Opportunity/Non-Discrimination Statement

Horry Georgetown Technical College prohibits discrimination and harassment, including sexual harassment and abuse, on the basis of race, color, gender, national or ethnic origin, age, religion, disability, marital status, veteran status, sexual orientation, gender identity, or pregnancy in educational programs and/or activities.

## Title IX Requirements

Horry Georgetown Technical College prohibits the offenses of domestic violence, dating violence, sexual assault, and stalking. Any student who believe he or she has experienced or witnessed discrimination including sexual harassment, domestic violence, dating violence, sexual assault or stalking is encouraged to report such incidents to one of the College's Title IX Coordinators.

\*Faculty and Staff are required to report incidents to the Title IX Coordinators 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).

<b>Inquiries regarding the non-discrimination policies:</b>	
Student and prospective student inquiries concerning Section 504, Title II, and Title IX and their application to the College or any student decision may be directed to the Associate Vice President for Student Affairs.	Employee and applicant inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Associate Vice President for Human Resources.
<b>Dr. Melissa Batten, AVP Student Affairs</b> <i>Title IX Coordinator</i>  Building 1100, Room 107A, Conway Campus PO Box 261966, Conway, SC 29528-6066 843-349-5228 <a href="mailto:Melissa.Batten@hgtc.edu">Melissa.Batten@hgtc.edu</a>	<b>Jacquelyne Snyder, AVP Human Resources</b> <i>Section 504, Title II, and Title IX Coordinator</i>  Building 200, Room 212A, Conway Campus PO Box 261966, Conway, SC 29528-6066 843-349-5212 <a href="mailto:Jacquelyne.Snyder@hgtc.edu">Jacquelyne.Snyder@hgtc.edu</a>