



INSTRUCTIONAL PACKAGE

BIO 102
Biological Sciences II

Effective Term
Fall 2021

INSTRUCTIONAL PACKAGE

Part I: Course Information

Effective Term: 2021-2022

COURSE PREFIX: BIO 102

COURSE TITLE: Biological Sciences II

CONTACT HOURS: 3-3

CREDIT HOURS: 4

RATIONALE FOR THE COURSE:

BIO 102 is the second course in a sequence that introduces students to concepts in Biology and helps relate this information to real-world applications. This course is intended for students pursuing more advanced scientific courses and through guided classroom and laboratory experiences, students will be develop a deeper appreciation of the biological world.

COURSE DESCRIPTION:

This course is a study of the classification of organisms and structural and functional considerations of all kingdoms (particularly major phyla as well as viruses). Vertebrate animals and vascular plants are emphasized. 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 101 Minimum Grade of C or Credit level BIO 101 Minimum Grade of TC

REQUIRED MATERIALS:

Please visit the [BOOKSTORE](#) online site for most current textbook information. Use the direct link to find textbooks.

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.
myHGTC and college 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

COURSE LEARNING OUTCOMES and ASSESSMENTS*:

Lecture Student Learning Outcomes:

Chapter 20: Viruses, Bacteria, and Archaea

Identify the basic structures of a virus.

Explain the unique characteristics of viruses compared to living cells.

Summarize the process of viral reproduction.

Explain the evolution of prokaryotes.

Identify structural features of prokaryotes.

List at least four ways in which the cells of prokaryotes differ from eukaryotic cells.

Identify the similarities and differences in the cell wall structure of Gram-positive and Gram-negative bacteria.

Identify three different metabolic types of bacteria and describe how they obtain nutrients from their environments.

Relate the unique properties of cyanobacteria.

List the biochemical characteristics that distinguish archaea from bacteria and eukaryotes.

Compare three different types of archaea and the habitats in which they are found.

Explain two ways in which archaea metabolize inorganic compounds in extreme environments.

Chapter 21: Protist Evolution and Diversity

Explain the origin of eukaryotic organelles.

Classify protists into one of two groups based on mode of nutrition.

Discuss the multiple evolutionary lineages of protists.

Identify the distinguishing characteristics of archaeplastida.

Summarize the life cycles of archaeplastida.

Identify the characteristics of the SAR supergroup.

Identify unique species within the SAR supergroup.

Summarize the life cycle of Plasmodium.

Relate the distinguishing characteristics of excavates.

Identify pathogenic excavate species.

Define the unique features of amoebozoans.

Identify the members of supergroup opisthokonta.

Relate the unique properties of rhizaria tests.

Chapter 22: Fungi Evolution and Diversity

Identify two traits that are similar between animals and fungi.

Distinguish among fungi that are haploid, dikaryotic, or diploid.

Define and identify the structural features of fungi.

List the major phyla of fungi.

Summarize the life cycle typical of fungi in each of the major phyla.

Identify one benefit and one disadvantage of human and fungi interactions.

Summarize the association that occurs between a fungus and its photosynthesizing partner in lichens.

Define mycorrhizae.

Explain the mutualistic relationship between mycorrhizae and plants.

Chapter 23: Plant Evolution and Diversity

Compare and contrast algae with land plants.

List the traits that enabled plants to adapt to life on land.

Evaluate the differences in the alternation of generations of land plants.

List the traits that classify a plant as a bryophyte.

Compare the three groups of bryophytes.

Identify the key structures and stages in the life cycle of a moss.

Summarize the unique structural adaptations found in the lycophytes.

List the features present in Cooksonia that make it a vascular plant.

Identify three types of pteridophytes.

Compare and contrast microphylls and megaphylls.

Identify the components of the ferns' life cycle.

Compare and contrast the differences between seed and seedless plants.

Compare different groups of gymnosperms.
Identify the key components of the gymnosperm and angiosperm life cycles.

Chapter 28: Invertebrate Evolution

List three common characteristics of animals that are not found in other multicellular eukaryotes.
Summarize the colonial flagellate hypothesis as it relates to the origin of animals.
Distinguish among the different body plans of animals.
Differentiate between protostome and deuterostome development.
Explain why sponges are considered the simplest animals.
Discuss how a sponge respire, feeds, and reproduces.
Compare the anatomical features of comb jellies to those of cnidarians, such as hydras.
List the basic features of lophotrochozoans.
Explain the basic anatomy and physiology of a planarian.
Summarize the steps in the life cycles of *Schistosoma* and *Taenia*.
Identify morphological features of molluscs, bivalves, rotifers, and annelids.
Identify the characteristics unique to ecdysozoans.
Compare the anatomical features of roundworms and arthropods.
List the five characteristics responsible for the success of the arthropods.
List the two major groups of animals in the Deuterostomia.
Identify the major morphological structures of the sea star, an echinoderm.
Summarize how sea stars move, feed, and reproduce.

Chapter 29: Vertebrate Evolution

Identify the four basic characteristics of a chordate.
Name the two groups of nonvertebrate chordates.
Summarize two features of each of the two groups of nonvertebrate chordates.
List the four characteristics that are unique to vertebrates.
Explain how the terms tetrapod, gnathostome, and amniote relate to vertebrate evolution.
Identify the geologic era and periods in which chordates and the first vertebrates appear.
List several features of jawless fishes.
List four characteristics shared by all jawed fishes.
Compare and contrast cartilaginous and bony fishes.
Discuss the evolutionary significance of lobe-finned fishes.
List the seven characteristics that define the amphibians.
Compare the features of the three groups of living amphibians.
List the seven features that define the reptiles.
Define traits of birds that are related to flight.
List five features of mammals.
Discuss the timeline of the evolution of mammals.
Identify several features that define each of the three living lineages of mammals.

Chapter 31: Animal Organization and Homeostasis

List and describe the four major types of tissues found in animals.
Identify the common locations of the various types of animal tissues.
Explain how specialization of cells in tissues enhances tissue function.
Distinguish among tissues, organs, and organ systems.

Summarize the major life processes carried out by each organ system in vertebrate animals.
List the two main cavities of the human body and the major organs found in each.
Distinguish between the functions of skin that are common to all animals and those that are unique to specific groups.
Identify the two main regions of skin and how these differ from the subcutaneous layer.
Explain the function of melanocytes in the skin and the effects of UV radiation.
Relate the makeup and function of the accessory structures of human skin.
Define homeostasis and explain why it is an essential feature of all living organisms.
Evaluate the evolutionary benefits of regulating an internal variable, such as body temperature, versus the cost.
Differentiate between positive and negative feedback mechanisms, and list one specific example of each in animals.

Chapter 32: Circulation and Cardiovascular Systems

List the common features that determine why some invertebrates, such as sponges, cnidarians, and flatworms, do not require a circulatory system.
Explain two differences between blood and hemolymph.
Compare and contrast the open circulatory system of an arthropod with the closed system of an annelid.
Distinguish among the structures and functions of arteries, veins, and capillaries.
Compare the path of blood in animals with a one-circuit circulatory pathway vs. a two-circuit pathway.
Identify the number of atria and ventricles in each type of vertebrate animal: fish, amphibians, most reptiles, crocodilians, birds, and mammals.
List the major components of the human heart, including the four chambers and four valves.
Trace the path of blood through the human heart, lungs, and major vessels leading to the lower leg.
Discuss how the SA and AV nodes control the contractions of the heart muscle, and how these electrical changes result in the characteristic patterns seen in an ECG.
Describe the major categories of cardiovascular disease that occur in the United States.
List the major types of blood cells and their functions.
Identify the major cellular and molecular events that result in a blood clot.
Compare and contrast the ABO and Rh blood classification systems.
Define capillary exchange and describe the two major forces involved.

Chapter 33: The Lymphatic and Immune Systems

Summarize the evidence suggesting that cellular slime molds can form a rudimentary "immune system."
Define PAMPs and explain how they enable many animals to identify the presence of harmful microbes.
Compare the types of antigens recognized by the innate versus the adaptive immune system.
Define three major functions of the lymphatic system.
Distinguish between the roles of primary and secondary lymphoid tissues and list examples of each.
Define innate immunity.
List four mechanisms of innate immunity and the major tissues, molecules, and/or cells involved.
Explain some specific ways that the innate immune system interacts with and influences the adaptive immune system.
Compare and contrast the activities of B cells and T cells.
Identify the basic structure of an antibody molecule and explain the different functions of IgG, IgA, IgM, & IgE.

Define monoclonal antibodies and list some specific applications of this technology.
Discuss active and passive immune responses, giving specific examples of each.
List the two main types of immunodeficiency disorders and provide examples of each.
Discuss the most common immunological mechanisms responsible for allergies and how these may be treated.
Define autoimmune disease and list several specific examples of these diseases.
Explain the types of precautions that must be taken when transplanting organs.

Chapter 34: Digestive Systems and Nutrition

Compare the structural features of incomplete versus complete digestive tracts.
Relate several examples of animals that are either continuous or discontinuous feeders.
Discuss some specific adaptations that are seen in omnivores, herbivores, and carnivores.
List all the major components of the human digestive tract, from the mouth to the anus.
Compare and contrast the structural features of the small intestine and the large intestine.
Discuss the major functions of the pancreas, liver, and gallbladder.
Summarize the overall characteristics and functions of digestive enzymes.
Compare the specific types of nutrients that are digested in the mouth, stomach, and small intestine.
List the major types of nutrients and provide examples of foods that are a good source of each.
Explain the connection between a person's diet and the likely development of obesity, type 2 diabetes, and cardiovascular disease.
Distinguish among vitamins, coenzymes, and minerals.

Chapter 35: Respiratory systems

Distinguish among ventilation, external respiration, and internal respiration.
Compare and contrast the gas-exchange mechanisms of hydras, earthworms, insects, aquatic vertebrates, and terrestrial vertebrates.
Trace the path of a molecule of oxygen as it passes from the human nose to an alveolus.
Compare the mechanisms used by amphibians, mammals, and birds to inflate their lungs.
Explain how the breathing rate in humans is influenced by both physical and chemical factors.
Summarize how carbon dioxide (CO₂) is carried in the blood and the effect that blood PCO₂ has on blood pH.
List several common disorders that mainly affect the upper respiratory tract as well as several that affect the lower respiratory tract.
Classify several common respiratory disorders according to whether they are mainly caused by allergies, infections, a genetic defect, or toxin exposure.

Chapter 36: Body Fluid Regulation and Excretory Systems

Describe the overall, specific functions of animal excretion systems.
Summarize the costs and benefits of the excretion of ammonia, urea, or uric acid as nitrogenous waste products.
Compare and contrast the excretory organs of earthworms, arthropods, aquatic vertebrates, and terrestrial vertebrates.
Trace the anatomical path that urine takes from the glomeruli to its exit from the body.
Explain the contributions of glomerular filtration, tubular reabsorption, and tubular secretion to the formation of urine.
Summarize the four major functions of human kidneys in maintaining homeostasis.

Chapter 37: Neurons and Nervous Systems

Compare the nervous systems of cnidarians, planarians, and annelids.

List the essential features of a typical vertebrate nervous system.

Explain the major adaptations that evolved in the brains of mammals.

Relate the basic structure of a neuron and compare the functions of the three types of neurons.

Discuss the changes in ion concentrations inside and outside a neuron that result in an action potential.

Summarize the role of various neurotransmitters in propagating nerve impulses.

Summarize the anatomy of the spinal cord and spinal nerves.

List the major regions of the human brain and describe some major functions of each.

Compare the causes and types of symptoms seen in some common CNS disorders.

Summarize the overall anatomy of the PNS, including the cranial nerves and spinal nerves.

Explain how the somatic system differs from the autonomic system.

Contrast the functions of the sympathetic and parasympathetic divisions of the autonomic nervous system.

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.

****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 Digestion Lab Report. 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, 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 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 #2.

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6. Use the [Online Resource Center \(ORC\)](#) including **Office 365 support**, **password resets**, and **username information**.
7. **In-person workshops, online tutorials and more services** are available in **Desire2Learn**, **Student Portal**, **Degree Works**, and **Office 365**.
8. **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 #2**.

STUDENT TESTING:

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

Further more 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 HGTC's [Accessibility and Disability Service webpage](#). The Accessibility and Disability staff 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, 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 educational programs and/or activities.

TITLE IX REQUIREMENTS:

All students (as well as other persons) at Horry-Georgetown Technical College are protected by Title IX—regardless of their sex, sexual orientation, gender identity, part- or full-time status, disability, race, or national origin—in all aspects of educational programs and activities. Any student, or other member of the college community, who believes that he/she is or has been a victim of sexual harassment or sexual violence may file a report with the college's Chief Student Services Officer, campus law enforcement, or with the college's Title IX Coordinator, or designee.

*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).

INQUIRIES REGARDING THE NON-DISCRIMINATION/TITLE IX POLICIES:

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 Vice President for Student Affairs.

Dr. Melissa Batten, VP Student Affairs

Title IX 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
EEO and Title IX Coordinator
Building 200, Room 212A, Conway Campus
PO Box 261966, Conway, SC 29528-6066
843-349-5212
Jacquelyne.Snyder@hgtc.edu