



Horry-Georgetown
Technical College

COURSE INSTRUCTIONAL PACKAGE

BIO 209

Principles of Environmental Science

Effective Term

Fall 2026/Spring 2027/Summer 2027

Part I: Course Information

Effective Term: Fall 2026/Spring 2027/Summer 2027

COURSE PREFIX: BIO 209

COURSE TITLE: Principles of Environmental Science

CONTACT HOURS: 3-3

CREDIT HOURS: 4

RATIONALE FOR THE COURSE:

BIO 209 introduces students to concepts of environmental biology and helps relate this information to real-world applications. This course intends to provide a laboratory science requirement for either Associate in Science or Associate in Arts majors. The course will enable students to develop a deeper understanding of the complex systems which support life on Earth.

COURSE DESCRIPTION:

This course focuses on the investigation and analyses of environmental elements. Scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world will be explored. Students will analyze natural and man-made environmental problems and solutions.

PREREQUISITES/CO-REQUISITES:

Credit level [BIO 101](#) Minimum Grade of C or Credit level [BIO 101](#) Minimum Grade of TC) or (Credit level [BIO 105](#) Minimum Grade of C or Credit level [BIO 105](#) 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:

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.

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.

ATTENDANCE VERIFICATION:

The Add/Drop Period is the first 7 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format classes. Please refer to the [academic calendar](#) for deadlines for add/drop. You must attend at least one meeting of all 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

IDENTIFICATION VERIFICATION:

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

STUDENT COURSE EVALUATIONS:

Each semester, students are provided with an opportunity to participate in course evaluation surveys. These evaluations offer crucial feedback to instructors and the College, leading to enhancement of educational quality. By completing these surveys, you play a key role in the ongoing improvement of teaching methods and course content, ensuring future students enjoy a better learning experience. Students are encouraged to complete these surveys as your active participation in this process reflects your dedication to your education and drives positive change.

CLASSROOM ETIQUETTE AND STUDENT RIGHTS AND RESPONSIBILITIES:

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 an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

To ensure a positive College experience, guidelines exist in numerous areas of campus life. The Student Code for The South Carolina Technical College System "The Student Code" (3-2-106.1) applies to all HGTC students. The Student Code sets forth rights and responsibilities of the individual student, identifies behaviors that are not consistent with the values of college communities, and describes the procedures that will be followed to adjudicate cases of alleged misconduct. Students are expected to conduct themselves in a civil manner, that is respectful of the rights of others, and that is compatible with the college's educational mission. Students are expected to comply with all of the college's duly established rules and regulations regarding student behavior while on campus; while participating in off-campus college sponsored activities; and while participating in off-campus clinical, field, internship, or in-service experiences. Students are expected to comply with all course requirements as specified by instructors in course syllabi and to meet the standards of acceptable classroom behavior set by instructors. For more information, login to your myHGTC account under "Student Rights and Responsibilities" card then select "Student Code of Conduct" or the "Student Catalog and Handbook."

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:

Chapter 1: Understanding Environmental Science

Define environmental science.

Describe environmental issues facing the world.

List examples of progress in environmental quality.

Define sustainability and sustainable development.

Explain and give examples of ecosystem services.

Summarize the concept of the “Tragedy of the Commons”.

Explain the process of science and the components of scientific research.

Define probability.

Define critical thinking and explain the importance of critical thinking to environmental science.

Describe outlooks on the relation of humans to the environment.
Identify individuals who helped shape outlooks and policies on resource conservation.

Chapter 2: Environmental Systems: Matter, Energy, and Life

Define systems and explain how feedback loops affect them.
Describe the materials that flow through ecosystems.
Define energy and differentiate between forms of energy.
Explain the first and second laws of thermodynamics and their application to living systems.
Summarize the flow of energy through ecosystems.
Explain the processes of photosynthesis and cellular respiration.
Define levels of biological organization.
Define biomass.
Explain the links between organisms in food webs.
Summarize the flow of carbon, nitrogen, phosphate, and sulfur through ecosystems.

Chapter 3: Evolution, Species Interactions, and Biological Communities

Explain how species diversity arises.
Describe the factors that lead to species distribution.
Define types of competition.
Explain adaptations related to predation.
Define and exemplify types of symbiotic relationships.
Explain the importance of keystone species in ecosystems.
Differentiate between exponential and logistic growth.
Define carrying capacity.
Differentiate between density-dependent and density-independent factors.
Differentiate between r-selected and K-selected species.
Analyze survivorship curves to determine life history strategies.
Explain factors affecting diversity, abundance, and distribution.
Describe the relationship between species diversity and community stability.
Define disturbance and explain how it affects communities.
Explain ecological succession and give examples of its stages.

Chapter 4: Human Populations

Describe the growth of human population throughout history.
Explain concerns about continued growth of human populations.
Explain perspectives on human population growth.
Describe the components of the "I=PAT" formula.
Explain the relationships between population growth and environmental impacts.
Define demography.
Define and explain statistical measures used in demographic calculations.
Describe differences in population growth in different parts of the world.
Describe factors which increase and decrease human population growth.
Interpret age-class histograms.
Describe factors that affect decisions about family size.
Explain the "demographic transition".
List methods of regulating fertility.
Explain population growth projections.

Chapter 5: Biomes and Biodiversity

Describe the nine major terrestrial biomes and factors controlling their distribution.
Describe open ocean and shoreline communities.
Explain the biological importance of coral reefs, mangroves, estuaries, and wetlands.
Describe types of freshwater ecosystems.
Define biodiversity.
List biodiversity hotspots.
Explain the benefits of biodiversity.
Describe the major threats to biodiversity.
Differentiate between endangered, threatened, and vulnerable species.
Describe efforts to protect biodiversity.

Chapter 6: Environmental Conservation: Forests, Grasslands, Parks, and Nature Preserves

Identify the amount of forested land remaining in the world.
Describe causes of deforestation.
Explain steps to preserve forests.
Describe the distribution of grasslands worldwide.
Explain activities that degrade grasslands.
List categories of protected areas.

Summarize the amount and type of protected land worldwide.
Describe the importance of preserve size and shape on species survival.

Chapter 7: Food and Agriculture

Define food security and explain its distribution worldwide.
Explain the health risks of undernourishment, poor diet, and overeating.
List primary food sources worldwide.
Describe components of soil and their relationship to soil fertility.
Explain a typical soil profile.
Describe causes of soil degradation.
Describe the environmental costs of farming.
Explain the costs and benefits of the green revolution.
Describe the use of genetically modified organisms in farming.
Describe ways to minimize the environmental costs of agriculture.
Describe the benefits of “locavorism” and eating low on the food chain.

Chapter 8: Environmental Health and Toxicology

Define environmental health.
Explain the concept of disability-adjusted life years as a measure of disease burden and list the leading causes of global disease burden.
Define and give examples of emergent diseases and their causes.
Define and explain categories of toxic substances.
Explain connections between ecology and health.
Describe movement of toxins through ecosystems.
Describe biological processes that reduce the effects of toxins.
Differentiate between acute and chronic effects of toxins.
Define and calculate LD50.
Contrast risk perception and actual risk.
Explain the factors that influence risk acceptability.
Rank relative risks to human welfare.

Chapter 9: Climate

Compare and contrast the troposphere and stratosphere.
Identify factors in natural climate variability.
Explain the greenhouse effect.
Identify how the greenhouse effect is changing the climate.

List effects of climate change.

Identify the strategies for minimizing global climate change.

Chapter 10: Air Pollution

Identify the main types and sources of conventional pollutants.

Describe hazardous air pollutants and their effects.

Discuss how air pollutants affect the climate and stratospheric ozone.

Describe the ways air pollution can affect human health.

Identify the policies and strategies for reducing air pollution.

Explain how the world air quality has changed over time.

Chapter 11: Water: Resources and Pollution

Identify how water is used and list its various sources.

Explain why water shortages occur.

Identify how water supplies can be increased.

Explain the costs associated with the different methods to increase water supplies.

Identify the ways in which water can be conserved.

Explain water pollution and its effects.

Describe the importance of sewage treatment and clean water in developing countries.

Explain how water pollution can be controlled.

Chapter 13: Energy

List the dominant sources of energy.

Explain peak oil production and the changing estimates of oil resources.

Compare and contrast the increasing use of natural gas.

Describe the environmental effects of coal burning.

Describe how nuclear reactors work and advantages and disadvantages of their use.

List the main renewables forms of energy.

Describe how solar, wind, hydropower, and other renewables effects the need for fossil fuels.

Describe a photovoltaic cell and its function.

Describe what biofuels are and the advantages and disadvantages of being used.

Chapter 14: Solid and Hazardous Waste

List the major components of the waste stream.

Describe how sanitary landfills operate and alternatives to landfills.

Explain the problems associated with ocean dumping.

Identify the “three Rs” of waste reduction, and which is most important.

Describe the process of converting biomass waste to natural gas.

Describe toxic and hazardous wastes and how they are disposed.

Explain bioremediation.

Describe the Superfund and its progress.

Chapter 16: Environmental Policy and Sustainability

Explain environmental policy and how it is formed.

Identify the NEPA and its role.

Describe some of the important US environmental laws.

Describe several international environmental laws and conventions.

Explain how the different branches of government influence environmental policy.

Explain some of the ways students can contribute to environmental protection.

Identify the Millennium Development Goals.

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.***

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%
<u>Lab</u>	<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, and Is also negatively impact academic progression and financial aid status.

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 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, refer to your Instructor's Course Information Sheet for any required on-site meeting times. In online courses, attendance is fulfilled through the submission of academic work. Please be aware that instructors may require exams to be proctored either online or at an approved testing site. If you choose to use a testing center other than those provided by HGTC, that center may charge a fee for its services.

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 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.

Visit the [Student Success & Tutoring Center](#) website for more information. To schedule tutoring or coaching, 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 SSTC [Online Resource Center](#) to access on-demand resources.

STUDENT INFORMATION CENTER – TECH Central:



TECH Central offers 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. You may also call (843) 349-5199.

**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 HGTC courses may occur during regularly scheduled class time or online, with or without proctoring. Tests may be delivered in the following formats:

- Digitally through D2L
- In writing on paper
- Through a publisher platform (note: some publisher platforms carry an associated fee)

Tests may include time limits and may require proctoring depending on the course.

When proctoring is required and is not provided by the course instructor in the classroom, students may complete their test face-to-face at an [HGTC Testing Center](#) or another approved testing site, or online using HGTC's online proctoring provider. For more information about available proctoring options, visit the [Online Testing](#) section of the HGTC Testing Center webpage.

Students testing at an HGTC Testing Center should note the following:

- **Appointments must be scheduled at least 24 hours in advance.**
- **A physical, government-issued photo ID is required to test.**

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 age, race, color, sex, religion, national origin, disability, and genetic information or any other protected classes deemed unlawful under State or Federal law 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.

All inquiries regarding the federal laws as they relate to discrimination on the basis of sex may be directed to Jen Riddei, Title IX Coordinator, Horry-Georgetown Technical College, Building 1100C, Room 107B, 2050 HWY 501 E, PO Box 261966, 843-349-5218, Jenifer.Riddei@hgtc.edu.

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, and Section 504 & Title II Coordinator, Horry-Georgetown Technical College, Building 1100C, Room 107A, 2050 HWY 501 E, PO Box 261966-6066, 843-349-5228, Melissa.Batten@hgtc.edu.

Employee and applicant inquiries concerning the federal laws and their application to the College may be directed to Jacquelyne Synder, Vice President, Human Resources and Employee Relations and 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.

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 sexual harassment, 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).

All inquiries regarding the federal laws as they relate to discrimination on the basis of sex may be directed to Jen Riddei, Title IX Coordinator, Horry-Georgetown Technical College, Building 1100C, Room 107B, 2050 HWY 501 E, PO Box 261966, 843-349-5218, Jenifer.Riddei@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](#).