HORRY GEORGETOWN TECHNICAL COLLEGE

INSTRUCTIONAL PACKAGE

BIO 209

Principles of Environmental Science

Fall 2018- Summer 2019

INSTRUCTIONAL PACKAGE

Part I: Course Information

Effective Term: 2018-2019

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 analysis 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 105 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: 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 12: Environmental Geology and Earth Resources
Describe tectonic plates and how their movement shapes the world.
Summarize where and why volcanoes and earthquakes occur.
Describe the environmental and social costs of mining and oil-and gas-drilling.
Identify how the consumption of geologic resources can be reduced.
Explain why floods and mass wasting are problems.

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 waster 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.

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	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.

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).

Inquiries regarding the non-discrimination 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 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.
Dr. Melissa Batten, AVP 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	**Jacquelyne Snyder, AVP Human Resources** *Section 504, Title II, and Title IX Coordinator* Building 200, Room 212A, Conway Campus PO Box 261966, Conway, SC 29528-6066 843-349-5212 Jacquelyne.Snyder@hgtc.edu