

# Environmental Problems Syllabus

BIOL 1305 --- Semester/Year

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Instructor:

Office:

Office Hours:

Class Time:

Room:

Contact Info:

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Text: Jay Withgott and Scott Brennan. *Environment: The Science Behind the Stories*. Benjamin Cummings, Inc. New York. **4<sup>th</sup> Ed.** ISBN: 9780321715349 or **3<sup>rd</sup> Ed.** ISBN: 9780805395730

Description: This course provides an introduction for non-biology majors into current problems our civilization faces in maintaining the stability, productivity, and sustainability of the earth environment. This class will identify relevant environmental issues, explore root causes underlying the problems, examine how local and national agencies are addressing mitigation, and assess potential remediation methods. **The objective of the course is to enable students to think intelligently and objectively about global environmental issues and to assess the information in a scientifically sound manner.**

Grades: Grades will be determined from online chapter quizzes, current event articles, attendance and participation, 2 in-class exams and a cumulative final exam. The final exam will be comprehensive, covering material from the entire semester.

Grade calculation:	Quizzes =	250 points
	Exam 1 =	100 points
	Exam 2 =	100 points
	Current events =	70 points
	Attend./partic. =	30 points
	<u>Final Exam =</u>	<u>150 points</u>
	TOTAL =	700 points

Grades are assigned by point values: **A = 630; B = 560; C = 490; D = 402.**

Exams: Because of the size of this class, all exams will be multiple-choice and graded by Scantron. Scantron forms will be provided. Each student will bring their student ID with their R number and two number 2 pencils to the exam.

Exam Dates: .

Lectures: Lectures are presented in 2 formats; Foundation material will be in adobe presentations through blackboard and is required to be completed **prior** to the scheduled in-class lecture. In-class lectures are informal discussions in critical reasoning applied to current environmental problems. The text is intended to clarify, conceptualize, and to supplement the detailed information given in the lectures. Exams will contain information from all lectures and discussions as well as application of critical thinking.

Students are encouraged to use other sources as well as the website provided by the text publisher to assist in this.

**Quizzes:** Quizzes are assigned on a chapter basis and are due by class time (12:30 p.m.) on the day scheduled for that lecture. Once class has begun the quiz is locked. Students may work ahead of schedule and may make multiple attempts at each quiz – the highest score will be recorded. All quizzes will be multiple-choice and administered through blackboard with the **Respondus lock down browser**.

**Current Events Assignments:** Each week read and submit a current news article related to environmental problems (any subject pertaining to class). Submission deadline is **midnight Sunday** and needs to include: article link, title, short (<250 words) description of article, how it pertains to topics in this course and your thoughts on it. There are 14 weekly assignments – **Early, Late or Copied submissions will not be accepted!!!** You should submit these in Assignment Link in Blackboard - Write or Paste your submission in the text box - NOT as an attachment. Example sites to get you started:

- |   |  |
|---|--|
| <input type="checkbox"/> NewYorkTimes.com   | <input type="checkbox"/> DailyToreador.com |
| <input type="checkbox"/> USAToday.com   | <input type="checkbox"/> Dallas News.com   |
| <input type="checkbox"/> ScienceDaily.com   | <input type="checkbox"/> Enn.com           |
| <input type="checkbox"/> Grist.org - “A Beacon in the Smog” or “Doom and Gloom with Humor |  |

– These are only examples you are free to send articles from other sites as well.

**Dropping:** Students may drop a class online without penalty until February 1. After that day, this needs to be done in person in the office of the Registrar (until **March 27**). After the deadline, the student must complete the course for a grade. The full regulation appears in OP 34.05, <http://www.depts.ttu.edu/opmanual/OP34.05.pdf> and <http://www.depts.ttu.edu/officialpublications/catalog/GenInfo.pdf>

**Incomplete:** The grade of “I” is given only when a student’s work is satisfactory but, due to reasons beyond his or her control, has not been completed. It is not given in lieu of an “F” or “W”. The instructor will stipulate in writing at the time the grade is given the conditions under which the “I” may be removed. The assigned work and a change of grade must be recorded within one calendar year from the date of the “I”. Failure to do so results in an “F” for that course.

**Attendance:** You are expected to attend and participate each class period unless you have a valid, verifiable excuse. Attendance will be noted and a grade will be assigned (30 possible points). Any student who must miss class because of a religious holiday must contact the instructor at the beginning of the semester. If you must miss a class, you are responsible for obtaining lecture notes, handouts, and other materials from classmates. The instructor will not provide copies of class notes. Students that regularly miss class usually perform poorly on exams.

**Make-up Exams:** Any student who must miss an exam because of a religious holiday must contact the instructor at the beginning of the semester to ensure that alternative

arrangements can be made. Make-up exams will only be allowed for documented illness or death. Without a verified excuse, the missed exam will be counted as 0.

Extra Credit: No extra credit opportunities are offered to individual students that are not offered to the entire class. Do not ask for special consideration.

Classroom Behavior: You are expected to conduct yourself in an adult and courteous manner and to be respectful of your classmates and instructor. Please be on time for class and wait to be dismissed before leaving the classroom or packing your books. You have enrolled in this class to learn. If your behavior during class is contrary to this mission, you will be asked to leave. Most of the topics for this class were chosen because they are timely and important to the lives of students. Questions, comments, and ideas are encouraged. Idle chatter with your neighbor during class, however, will not be permitted. Sleeping, texting, web-browsing, reading newspapers, listening to ipods or other devices is NOT permitted and may result in dismissal from the classroom. **TURN OFF ALL RINGERS TO MOBILE PHONES AND PAGERS DURING CLASS PERIODS.**

Warning: Students will be evaluated for their *individual* efforts and performances during this course. Cheating, plagiarism, and misconduct to any degree will not be tolerated. In such cases the student may be assigned a failing grade for the course or for the exam (at the instructor's discretion).

Disabilities: Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office at 335 West Hall or 806-742-2405.

Core Curriculum Statement: This course satisfies one-half of the Texas Tech University Life and Physical Science Core Curriculum requirements. The accompanying lab, BIOL 1113, is a graduation requirement but it is not part of the core curriculum. Courses in this category focus on describing, explaining, and predicting natural phenomena using scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences. The objective of the study of the natural sciences component of a core curriculum is to enable the student to understand, construct, and evaluate relationships in the natural sciences, and to enable the student to understand the bases for building and testing theories.

*Students graduating from Texas Tech University should be able to explain some of the major concepts in the natural sciences and demonstrate an understanding of scientific approaches to problem solving, including ethics.*

The following Learning Outcomes, from the Texas Higher Education Coordinating Board (CB) and from Texas Tech University (TTU), must be included in all Life and Physical Science classes in the Core and this is how they will be addressed and assessed.

CB Objective 1. Critical Thinking Skills: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information:

Students are presented fundamental and discussion lectures; the former are provided online accessible throughout the course and the latter occur during each face-to-face meeting. Fundamental lectures provide information and knowledge necessary to understand the science principles behind current topics. Assessment of the fundamentals is achieved by online quizzes that must be completed prior to the beginning of the face-to-face lecture on the topic. The discussion lectures require student to apply the fundamental knowledge to contemporary environmental issues, including both the science and policy. Assessment of this objective is by online discussion group assignments with presentation of group consensus to the class within the discussion lectures, and by specific written exam questions. Lab write-ups include specific questions to assess understanding of the presented concepts and synthesis of the material in related scenarios or along projected time frames.

CB Objective 2. Communication Skills: to include effective development, interpretation and expression of ideas through written, oral and visual communication:

Students are required to write weekly short essays on articles that they must find, summarizing the content and providing their own insights and perspectives on these topics. They engage in oral communication through in-class discussion of contentious environmental issues. They are expected to be able to interpret graphs both in class and on exams. The weekly assignments are graded for appropriate topic, presence of a summary of the content and personal insight relating the article to course topics. Participation in class discussions is assessed by daily participation grades and random roll call query. Weekly lab activities include written reports requiring the creation and interpretation of graphs using personal, group and class data measurements.

CB Objective 3. Empirical and Quantitative Skills: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions:

Students evaluate and interpret numerical data in the form of graphs, and charts on in-class assignments and exams. They must demonstrate mastery of primary math skills, such as understanding averages, metric system and at least the basics of statistical significance. Laboratory reports assess empirical and qualitative skills on a weekly basis including gathering, manipulation, and analysis of data on a weekly basis. Lecture assessment of empirical and quantitative skills is by specific exam questions requiring interpretation and analysis of given data.

CB Objective 4. Teamwork: to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal:

Included in the lecture portion of the class, students interact through on-line group discussion topics that they must respond to and come to a group consensus regarding ecological and environmental problems that they will discuss as a collective in class. Assessment takes into account quality of the posts as well as quantity. The lab requires students to work throughout the semester in groups of 4. Within the group an approach and job assignment for each lab must be worked out and consensus drawn within the group for the written report. Also, one heavily weighted lab activity is a group paper and class presentation on a topic of the groups choosing. Assessment of both written report and oral presentation is accomplished by rubrics published in the student lab manual and includes emphasis on equal participation and effectiveness of group work.

TTU Objective 1. Demonstrate knowledge of the scientific method and to contrast it with other ways of understanding the world:

Lectures and assignments will expose students to the scientific method, contrasting it with other ways of gaining knowledge about the natural world. Specific questions on the first and final exams directly assess their knowledge of this objective. Also, the required online quizzes include a pre course quiz given in the first week and an identical quiz given in the last week of the course addressing scientific method and critical reasoning through inductive and deductive reasoning. Questions from these quizzes appear in exams during the semester. Pre and post course quizzes are graded on questions attempted rather than correct answers as they are explained to be a tool to evaluate course effectiveness. Lab activities require the student to personally step through the scientific method for each lab activity and written report on a weekly basis.

TTU Objective 2. Demonstrate knowledge of the tools and methods used by scientists to study the natural world:

Students will be exposed to the process by which scientific knowledge is gained and will have to use this process to solve environmental problems on exams and group and class discussions. In face-to-face discussion lectures the instructor guides students through a discussion of contemporary issues they are familiar with through media or personal experience using scientific fundamentals, facts and principles learned in the fundamental online lectures. Comparisons and relationships between scientific, economic, politic, and ethical views are explored so a student becomes aware of the issues they encounter daily. Students acquire hands on knowledge of scientific methods and tools as they complete weekly laboratory assignments.

TTU Objective 3. Explain some of the major theories in the Natural Sciences:

Students will have to demonstrate, via exams, mastery of the traditional and contemporary paradigms of natural science, including natural selection and climate change. In face-to-face discussion lectures students discuss the major theories of Natural Sciences and their intersection with contemporary issues using scientific fundamentals, facts and principles learned in the fundamental online lectures. Comparisons of scientific theories and contemporary controversies surrounding major theories are examined by development of testable hypotheses, method, and discussions of published studies testing those hypotheses. The purpose is to develop an understanding of the student how major theories in the Natural Sciences arise and the weight of evidence behind them.

Assessment is by specific embedded exam questions requiring them to distinguish scientific weight of evidence from opinion options.

TTU Objective 4. Describe how Natural Sciences research informs societal issues, including ethics:

Applications of research for human well-being and societal benefit are heavily emphasized in this class, including topics of pollution, human population growth, environmental sustainability etc. The role of scientific research in public policy and how it differs from the political and economic aspects of the debate are covered in lectures. The role of scientific ethics as well as societal ethics is strongly emphasized in discussions around solutions of environmental problems. Assessment of this objective is through exam questions on the topic and the Current Event Assignments.

College Level Competency Objective 1: Students graduating from Texas Tech University should be able to: explain some of the major concepts in the Natural Sciences and to demonstrate an understanding of scientific approaches to problem solving, including ethics.

Upon successful completion of this course, students will have been exposed to the major concepts of biology and demonstrate their understanding of the scientific approach in gaining knowledge about this subject and how the topic affects human well-being.

## ***Biology 1305 Course Outline***

A TENTATIVE schedule of class times and subjects are listed below.

<b>Date</b>	<b>Quiz</b>	<b>Topic</b>
Class 1	***	<u>Introduction</u>
2	Pre & Sylb	<u>Introduction to Environmental Science</u> (Chapter 1)
3	1, 2**	<u>Chemistry for Life</u> (Chapter 2)
4	3	<u>Population Ecology</u> (Chapter 3)
5	4	<u>Community Ecology</u> (Chapter 4)
6	5	<u>Ecosystem Ecology</u> (Chapter 5)
7	6	<u>Environmental Ethics and Economics</u> (Chapter 6)
8	7	<u>Environmental Policy</u> (Chapter 7)
9	8	<u>Population growth</u> (Chapter 8)
<b>10</b>		<b><u>1<sup>st</sup> In-class Exam (Chapters 1 - 8 and all lecture material)</u></b>
11	9/10	<u>Soil system</u> (Chapter 9)
12		<u>Agriculture</u> (Chapter 10)
13	11	<u>Conservation Ecology</u> (Chapter 11)
14	12	<u>Resource Management</u> (Chapter 12)
15	13	<u>Urbanization</u> (Chapter 13)
16		SPRING BREAK
17	14	<u>Environmental Toxicology</u> (Chapter 14)
18	15	<u>Freshwater</u> (Chapter 15)
19	16	<u>Marine Systems and Resources</u> (Chapter 16)
20	17	<u>Atmospheric Science</u> (Chapter 17)
21	18	<u>Global Climate Change</u> (Chapter 18)
22		<b><u>2<sup>nd</sup> In-class Exam (Chapters 9 - 18 and all lecture material)</u></b>
23	19	<u>Fossil Fuel</u> (Chapter 19)
24	20	<u>Conventional Energy Alternatives</u> (Chapter 20)
25	21	<u>Renewable Energy</u> (Chapter 21)
26	22	<u>Waste Management</u> (Chapter 22)
27	23	<u>Mining and Minerals</u> (Chapter 23)
28	24	<u>Sustainable Solutions</u> (Chapter 24)
29		<b>Review for final exam</b>

**30**

**Final Exam -- 1:30 – 4:00pm (Comprehensive + 19 – 24)**

\*\*\*precourse quiz, syllabus quiz, Chapter 1 and 2 quizzes all due before Jan 24, 12:30\*\*\*

**Biology 1113: Environmental Problems Laboratory**

Room 9, Biological Sciences Building

**Fall 2012**

**Instructors:**

AA	AA@ttu.edu	CC	CC@ttu.edu
BB	BB@ttu.edu	DD	DD@ttu.edu

**Lab Coordinator:**

**Course Description:**

This course is designed to provide an introduction to both current environmental problems and a historical perspective of environmental policies for non-biology majors. This class will provide a hands-on approach to identify environmental issues, explore their underlying causes, assess potential solutions, and the role of environmental policy. The objective of this course is to enable students to think intelligently and objectively about environmental issues.

**Credit:** 1 hour

**Natural Science Core Statement:**

This course satisfies 1 hour of the 2 student credit hour TTU science laboratory graduation requirement.

**Expected Learning Outcomes:**

Students will become aware of the breadth of environmental problems and acquire the ability to discuss current environmental problems. Upon successfully completing the course, students should have the skills to acknowledge and address global and local environmental problems.

**Methods of Assessment:**

Assessment of learning outcomes is based on in-class activities, homework, assignments, quizzes, and exams.

**Textbook:** *Environmental Problems Lab Manual* (required) Purchase from TTUAB in basement of Biology (\$15).

**Grading:** The lab grade will be calculated as follows:

<b>Activity</b>	<b>Point Value</b>
Daily Activity Grade	900 (75 pts x 12 labs)
Final Exam	100
<b>Total</b>	<b>1000</b>

Final letter grades are assigned according to the following distribution:

< 60% = F      60%-69% = D      70%-79% = C      80%-89% = B      90%-100% = A

**Daily Activity Grade:** This includes in-class participation, lab reports, and homework assignments.

**Final Exam:** The exam will be comprehensive and include multiple choice and short answer questions.

**Requested materials:** Each student will need to bring in a 2L bottle to lab and participate in the monitoring of your group's biodegradation experiment.

**Lab Safety:** Although all lab activities have been designed with safety in mind, lab safety is taken seriously. Proper attire for lab classes includes closed toed shoes shirts with sleeves and long pants. No food or drink is allowed in the lab classroom.

**Due Dates:** All assignments are due on the date assigned by your lab instructor. Reading Assignment questions at the beginning of each lab will be due and collected at the **beginning** of the class. Late assignments will lose 10% of their possible value each day. (i.e. a 75 point assignment will lose 7.5 points each day after the due date. If an assignment is one week late, only 50% of the possible points can be earned.) Assignments more than one week late will not be accepted and will earn 0 pts. If you have an excused absence, your lab instructor will assign a due date for the make-up material.

**Attendance:** Success in this course requires regular and punctual attendance. **Unexcused absences** cannot be made up and any assignments or points associated with the lab will be lost. **More than 2 unexcused absences will result in zero credit for the course.**

**Excused absences** can be made up. University criteria for an excused absence are one due to a religious holiday, a family death, a mandatory TTU function, or personal illness. You must notify your instructor of any planned absence prior to the date of the absence, if possible. If you are sick, you should notify your instructor or the Biology Department concerning your illness prior to class. You must also present your instructor with official documentation from a vouching authority for an absence to be excused. Communication with your TA should be made either in person or via official TTU email addresses.

**Excused absences MUST BE made up to receive credit for the missed lab.** If possible, missed labs should be made up by attending another regular lab section. It is essential, however, that you make arrangements with your instructor before attending another lab. Do not simply show up at a lab section without prior arrangements and expect to be accommodated. If it is not possible to attend another lab section, you will write 3 page paper, plus a page for references (3 - 4 references), on the subject of the lab you missed to receive credit for that lab. The paper must be typed in Times New Roman, 12 point font, 1.5" line spacing, and have normal margins no greater than 1". The due date will be 1 week after your return to class or as assigned by instructor. **Any assignments that contain plagiarized material will receive a 0.**

**Academic Misconduct:** All students must adhere to the University policy on academic honesty. For further information see the *Academic Integrity A Guide for Students and Faculty* brochure available from the Dean of Students Office or the section on academic integrity in the university undergraduate catalog.

**Student Disability:** Any student who, because of a disability, requires special arrangements to meet course requirements should contact the instructor as soon as possible to make recommended accommodations from Disable Student Services.

#### Lab Schedule

Week of	Lab Activity
28 Aug.	I. Introduction to Environmental Problems
3 Sept.	VII. Waste Management
10 Sept.	III. Agricultural Impacts

17 Sept.	IV. Freshwater Environmental Problems
24 Sept.	V. Marine Environmental Problems
1 Oct.	II. Habitat Loss
8 Oct.	IX. Biodiversity Loss
15 Oct.	VIII. Environmental Toxicology
22 Oct.	VI. Air Pollution
29 Oct.	X. Overpopulation
5 Nov.	XI. Energy Consumption
15 Nov.	XII. Global Climate Change
19 Nov.	OFF - Thanksgiving Week
26 Nov.	Final Exam