**LANE COMMUNITY COLLEGE SCIENCE DEPARTMENT**

 **Fall 2016**

**Aquatic Environment, ENSC 183**

Class Hours: T\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Instructor: \_\_\_\_\_\_\_\_\_\_

Office Hours: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ CRN: \_\_\_\_\_

Course credit: 4 Office location: 16/190\_

E-mail address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Office phone: 541-463-\_\_\_\_

Required Texts and Materials:

Fresh Water by E. C. Pielou, University of Chicago Press, 1998

Course Description: Students learn about freshwater and marine systems including their biology, geology, chemistry, circulation, climate and interactions with humans. Topics and labs include aquatic biodiversity, streams, water pollution, ocean currents, fisheries, sustaining aquatic systems and water resources. Take ENSC 181-183 in any order.

Objectives: The objective of this course is to give students a thorough and comprehensive understanding of the natural systems of the earth as pertaining to liquid water, covering the interactions of liquid water, within its geological framework, with biological organisms. Most of the class time and material will concentrate on fresh water environments. A portion of the class material will be examining the effects of humans on this finite resource, and how those changes in turn may affect other organisms. A combination of lecture, lab, demonstration, field work and small group work is used to meet course objectives. You should be prepared to go outside in inclement weather, or sunny weather (please take appropriate precautions).

COURSE OUTCOMES

Upon successful completion of this course, the student should be able to:

* Evaluate and perform scientific procedures and methods.
* Demonstrate and describe key chemical and physical properties of water.
* Evaluate major environmental threats to, mitigation of and adaptation to change in freshwater and marine systems related to pollution, fisheries collapse, water shortages, and/or effects of climate change. Explore social justice issues associated with these problems.
* Research the global importance of aquatic biodiversity and ongoing conservation efforts.
* Develop hypotheses and collect field data to study physical parameters including dissolved oxygen, nutrients, pH, and turbidity, and to study life in aquatic ecosystems.
* Demonstrate critical thinking skills by gathering and assessing information about current environmental issues and sustainability related to aquatic ecosystems and water resources conservation.

General Science Learning Outcomes:

* Students will be able to recognize and make pertinent observations, ask relevant questions, and form testable hypotheses.
* Students will be able to analyze data and draw supportable conclusions.
* Students will be able to collect and display precise data using appropriate technology and equipment safely.
* Student will be able to describe the dynamic nature of science.

|  |  |
| --- | --- |
| Week | Topic |
| Week 1 | Introduction Scientific methodsIntroduction to scientific methods for use throughout the term: Observation, measurement, data management and processing, graphs, communicating, experimentation, replication, control, hypothesizing, testing hypotheses, communicating, modeling, theorizing, communicating |
| Week 2 | WaterChemical and Physical Properties of Water, properties of groundwater and soil water, atmosphere, biosphere, lithosphere, and cryosphere water cycling |
| Week 3 | Freshwater Freshwater chemistry and ecology; watershed geometry and dynamics, stream flow, flooding; lakes, eutrophication, groundwater; map skills  |
| Week 4 | aquatic ecosystem comparison; freshwater organisms and nutrient cycling; water resources; field data collection and analysis, effects of climate change on watersheds |
| Week 5 | Environmental issues with freshwaterWater Use and Management |
| Week 6 | Water Pollution and cleanupEffects of climate change on freshwater environments |
| Week 7 | Estuaries Transition from freshwater to saltwater Estuary dynamics, biodiversity, ecosystem collapse, and pollution |
| Week 8 | Oceans Physical processes of the oceans, temperature variationOcean currents, El Niño, La Niña Chemistry of the Oceans: pH, salinity, and solutes |
| Week 9 | Marine productivity and biodiversity: photosynthesis and chemosynthesis, zonation of coastal waters; open ocean, ocean deserts, vent communities Ocean pollution, dead zones, ocean acidification, and long-term threatsEffects of climate change on oceans |
| Week 10 | Marine conservation, empty oceans, fisheries, fishery managementEconomic and social issues of ocean pollution and fisheries depletion |
| Week 11 | Final |

Topics Covered in Text (Fresh Water by E. C. Pielou)

Introduction/Water Cycle Chapter 1

Groundwater Chapters 2 and 3

Vadose Zone Chapter 4

Flowing Water/Streams and Rivers Chapters 5 and 6

Lakes/Still Water Chapter 7

Frozen Water Chapter 8

Dams and Reservoirs Chapter 9

Wetlands Chapter 10

Microscopic Life Chapter 11

Water in the Atmosphere Chapter 12

\*Note: there is also a lot of information covered in class that is not in the text. If you miss class make sure to get notes from a classmate.

*Final Exam: Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Time: \_\_\_\_\_\_\_\_\_\_\_\_\_*

Grading Assessment Policy:

18% Labs (there are 9 – lowest is dropped)

22% Activities (some are done in groups)

38% Quizzes (there are 8)

6% Concepts quiz (Mini-midterm)

16% Final Exam

100% Term total

Grade Scale:

99-100: A+

93-98: A

90-92: A-

88-89: B+

83-87: B

80-82: B-

78-79: C+

70-77: C

66-69: C-

60-65: D

below 60: F

Attendance policy: Students are expected to attend every scheduled session.

Students who do not attend class during the first week will be dropped from the class. There will be some type of in-class work, lab, activity or campus walk almost every day. There is no make-up for missed labs. The lowest lab will be dropped. Most activities can be made up.

Labs are due at the end of class. Activities are due 2 class days after they are done in class. If you have been out sick you must turn in the activities 1 class day after you return or incur a “late penalty”. Activities that are over 10 days late will only be worth 60% of orignal credit.

Accessibility and Accommodations:

To request assistance or accommodations related to disability, contact the Center for Accessible Resources at (541) 463-5150 (voice), 711 (TTY),  AccessibleResources@lanecc.edu (e-mail), or stop by Building 1, Room 218.

Please be aware that any accessible tables and chairs in this room should remain available for authorized students who find that standard classroom seating is not usable.

At Lane Community College, students, faculty, and staff are protected from, and prohibited from engaging in, harassment and discrimination. This includes, but is not limited to harassment based on race, ethnicity, national origin, gender, marital status, familial relationship, sexual orientation, gender identity/ expression, pregnancy, age, disability, religion, or veteran status. Furthermore, a class setting is one in which it is expected that all ideas and opinions are to be respected and that the class be offered in a non-threatening environment. I expect all participants to afford respect and civility to each other.

If you believe you have been harassed or discriminated against, wish to report someone engaging in discrimination, or for more information, contact the Counseling Office; immediate needs can be met by calling x8888.

In case of emergency (including medical) call Public Safety, x5555. Courtesy phones are located on the second floor of the Science building. If calling from a cell phone dial 541-463-5555.

Moodle:

You will be using computers and the internet. I usually put quiz reviews and notes out on Moodle a few days before each quiz. I will have the class schedule and syllabus on Moodle. There will be some labs/activities that require internet use. There are computers in the classroom and other locations on campus. There may also be some online readings.

The Science Resource Center (SRC) is in room 193. It has computers, internet access and a printer. It is there for students. Any make-up quizzes will be taken in the SRC.

It is your responsibility to be prepared for the quizzes. Any make-up quizzes will be mostly essay. You will have 1 week to make up the quiz. This also applies to the concept quiz.

All work must be cited – and must represent your own understanding of the material. LCC has a Student Code of Conduct that should be read, understood, and adhered to in all classes you take. The link is here:

 http://www2.lanecc.edu/copps/student-code-conduct

WARNING: This room is a lab room and therefore considered contaminated. Hydrochloric acid and rocks containing lead have been on these tables. Drinks are permitted only if they have a sealed lid. However, if you need a “food break” please take the food outside of the room. Please do not leave backpacks in the aisles as they are a safety hazard.