Stream Ecology

2013 Course Overview and Syllabus

Welcome to the world of Stream-Side studies. This Stream Side science course will study quantifiable aspects of ‘fresh’ water systems using classroom (internet) and field studies. The course is a 18 week, 1- credit course offered at Southwest Minnesota Christian High School.

Instructor: Gregory Dyk

COURSE OBJECTIVES

1. Our first and foremost objective is to provide hands-on experience in stream ecology by monitoring a particular stream and evaluating its water resource characteristics in a format to stimulate students to continue investigating water resources in other environments.

2. Learn about the most significant (and interesting) water quality and water resource properties (physical, chemical, hydrological, biological) and how to integrate these measurements into a Water Quality Index (WQI).

3. Expose students to the many, many different and emerging resources for teaching water quality as a lab-based, hands-on study program and develop a reference library of resources, experiments, demonstrations, and activities to help teachers and students understand the importance of water resources in everyday lives.

4. Understand how water quality and water resource properties interact to affect the quality of our environment and how 'water resources' as identifiable units are components of the landscape ecosystem and its processes.

5. Attend the campout at Camden State Park this Oct. The work accomplished cannot be made-up or duplicated.

6. Have FUN experiencing stream side water quality, water quality monitoring, collecting and artificial duplication of organisms, and becoming familiar with fly fishing.

This classroom's approach is to enhance learning through inquiry, investigation, and analysis using collaborative learning through team work and sharing of learning experiences. The following instructional pedagogies are integrated into the class:

1. Inquiry
2. Hands-on active learning
3. Multi-sensory methods of learning
4. Student-to-student interaction
5. Discourse and reflective thinking
6. Readings and research

Each weeks work will include reading assignments, participatory streamside activities, supplemental resources, participation and exchange in discussions, and written homework assignments.

Students will also be required to read 3 novels and complete the necessary requirements for each novel.

COURSE STANDARDS/GOALS

A. Science will encourage students to take joy and delight in exploring and coming to understand God's world
   (-Unifying Concepts and Processes)
   a. Systems, order, and organization
   b. Evidence, models, and explanation
   c. Change, consistency, and measurements
   d. Evolution and equilibrium
   e. Form and Function

B. Students are involved in designing experiments, making observations and contributing to existing knowledge in science

(-Science as Inquiry)

a. Identify questions and concepts that guide scientific investigation
b. Design and conduct scientific investigations
c. Use technology and mathematics to improve scientific investigations
d. Formulate and revise scientific explanations and models using logic and evidence
e. Recognize and analyze alternative explanations and models
f. Communicate and defend a scientific argument
g. Understand scientific inquiry

C. Students will learn that physical and living things are created by God and not merely nature, environmental or natural resources

(-Physical Science)

a. Structure of the atom
b. Structure and properties of matter
c. Chemical reactions
d. Conservation of energy and the increase of disorder
e. Interactions of energy and matter

D. Science is a human cultural activity through which God can be glorified and human life enhanced or used in life distorting ways

(-Science and Technology)

a. Identify a problem or design an opportunity
b. Propose designs and choose between alternative solutions
c. Implement a proposed solution
d. Evaluate the solution and its consequences
e. Communicate the problem, process, and solution
f. Understand science and technology

E. Through the study of science, students gain a deepened understanding of how they are the care-takers of creation and responsible to God for maintaining, developing and restoring it

(-Science in Personal and Social Perspectives)

a. Personal and community health
b. Population growth
c. Natural resources
d. Environmental quality
e. Natural and human-induced hazards
f. Science and technology in local, national, and global challenges

F. Students will study science in the context of human history and develop a Biblical perspective in personal and communal decision making

(-History and the Nature of Science)

a. Science as a human endeavor
b. Nature of scientific knowledge
c. Historical perspective

COURSE EXPECTATIONS

My job is to help you get through this course successfully while navigating the unexpected roadblocks of life. So, to help assure that class goes smoothly, please try to stick by some basic requests.

1. Please note that you are expected to commit to each and every week of this course. Please do not plan to be gone during extended amounts of time during the course unless it is unavoidable (personal illness, family illness, etc.) However, we understand that life happens and if we need to work around unexpected bumps - we will! With that said.....LET US KNOW BY THE END OF WEEK ONE IF YOU KNOW THERE IS A SIGNIFICANT PORTION OF CLASS YOU KNOW YOU MUST MISS. That way we have time to work something out.

2. Complete assignments by the due date. If something unexpected does occur, CONTACT ME IMMEDIATELY and we will work something out. If you don't let me know something will be late you will lose 5% per day.

3. Please act in a professional manner. This is an upper level course and you are expected to behave appropriately and submit assignments that match your level of education.

4. Be respectful to your teachers, classmates, and equipment at all times.