

Integrated Studies in Environmental Science (ENVS 109 WD1)

Instructor: Dr. Robert MacKay

Office Phone: 360-992-6086

e-mail: rmackay@clark.edu

Office hours: T,Th 10:00AM to 1:00 PM

Course Web Page: <http://www.atmosedu.com/ENVS109/>

Welcome to ENVS 109. The course is designed as a general science distribution course for non-science majors and has been specifically designed for the weekend degree program and for student success. If at anytime you have any questions send me an e-mail or post your question on the General Questions Discussion forum on blackboard. I am here to help guide you through your learning process. Although we will use blackboard for quizzes, discussions, and uploading assignments, most resources are available through our class website at the link above.

Course description

This lab science course introduces students to an integrated environmental science approach focusing on Earth as a system. Readings, quizzes, videos, discussions, homework activities, and laboratory work designed specifically to complement lecture topics. The course is designed to increase student understanding of the basic physical laws important to understanding natural environmental processes and current environmental issues related to human activities. Topics will include: Understanding Earth as a complex system, Systems thinking, Climate Change, Air Pollution, Stratospheric Ozone depletion, Ocean and atmospheric structure and composition; The hydrological cycle and issues related to water availability and quality, Global ice sheets and their evolution, and Land use changes.

Required Materials. Low cost Water Quality Kit, Thermometer, Spring scale, metric ruler, Microsoft Office (Word , Excel, and PowerPoint) or open office suite (free) [<http://download.openoffice.org/>]

Mathematics Requirements: Students should be able to add, multiply, and divide. During the first two weeks we will be reviewing graphs, learning how to use excel for scientific purposes, and learning some basic information about systems. Some of the material seems kind of Mathy but

please do not let it frighten you. I do understand that many in the class have Math anxiety and I have gauged activities accordingly. Most of your grade for the course will be from written assignments, presentations, and other activities, but I do want to expose you to some useful ideas, some math related, at the beginning of the term. Please ask questions when you feel stumped. Posting questions on the discussion board is a great way to go as some of your fellow classmates may have some good ideas.

Assessment:

- 2- Exams: 30%
- Term Project: 15% (see [Term Project](#) for specifics)
- Design and construct a [solar water heater](#) (7%)
- 3-Required Summaries 9% (see [Scientific Summary](#) for specifics)
- Discussion board postings; see below (5%)
- [Online reading quizzes](#) 10 %
- All other Homework and Labs(24%)

Below is more information related to each activity with links to even more detail where appropriate. An estimate of total hours this term that will be devoted to each activity is given. The idea here is that the total hours for the 10 week term should be about 150 hours (15 hrs per week).

Exams (~10 hrs taking exam and studying notes before exam): The readings, homework, and quizzes are meant to prepare you for exams. The idea is to go back over these things to solidify your knowledge and understanding. The review link on the schedule page for each week is a useful resource for possible essay questions or short answer questions. The first mid-term exam will be given on Saturday July 31 from 8-9 AM. The second exam will be on material covered that was not included on the first exam and will be available as an on line download August 26 (MS word doc) and will be handed in (uploaded on blackboard) by 11:55 PM on Friday, August 27.

Term Project (~20 hrs): You will use the “Low Cost Water Quality Kit” to measure the water quality over the term of a site selected by you. See [Water QualityProject](#) for more information. The term project is considered be worth 3 4-hour labs.

Design and construct a solar water heater (~10 hrs). This activity counts for 1 4-hour lab and is also considered a homework project. See [Solar water Heater](#) for more information.

Three required summaries (~12 hours): You will write three summaries of scientific articles, papers, essays, or books on topics related to environmental science of your choice. See [Scientific Summary](#) for more information. These may be submitted anytime between the start of our class and 11:59 PM on August 27. There are several interesting articles posted on our class web page at [articles](#).

Discussion Board Postings(~8 hrs, reading other ideas even if you do not post): Each week there will be 2 discussion board forums. One for General Questions about any aspect related to the class structure or mechanics. The other will be a discussion of the question for the week. The course minimum requirement is that you contribute a minimum of 5 meaningful postings over the course of the term. The idea here is that you may or may not be inspired to contribute to each topic but you must push yourself to contribute at least 5 times. Quality discussion posting should have reference to data, or diagrams whenever possible and cite references for any factual information.

Reading quizzes (~45 hrs): Online reading quizzes will be included on Blackboard, allotted time includes reading the material. Although the [online reading quizzes](#) are only 10 % of your overall grade the reading will help you with all other aspects of the course including exams. Some exam questions will be directly from the reading quiz questions. Please feel free to work with others in the class on these online quizzes. The purpose of these is to make sure catch some of the key ideas, concepts, and interesting facts presented in the assigned reading.

Other Labs and other homework (~45 hrs): Labs and other homework will often be presented to you as an MS word document that you can edit by adding your answers and then submitting (upload) via blackboard. Several summaries of assigned essays or readings will also be requested. See [other summaries](#) for more detail. Video summaries may also be required See [Video Summaries](#). Occasionally you will be asked to draw your own figure. It is okay to draw a nice figure by hand and then either scan it or take a digital photo to electronically insert into an MS Word Document or other presentation document. I like to use a paint program to process the image a

little before copying it into a document as this can make the total document size more manageable.

Overall learning objectives:

- Students will become familiar with Earth as a system and learn to communicate effectively about environmental issues using an “Earth System” perspective.
- Students will learn fundamental terminology, principles, and relationships related to environmental sciences and the Earth system.
- Students will make appropriate use of written, oral, and visual communication skills while communicating their understanding of concepts and issues related to atmospheric science.
- Students learn how to safely acquire scientific information from traditional measurement techniques (instrumentation) and understand the importance of precision, accuracy, and environmental safety.
- Students will take responsibility for your own learning.
- Develop the ability to work and think independently.
- Develop the ability to work and think within a team or larger group.
- Students learn how to create graphs (x-y scatter plots) and use graphs (x-y scatter plots, bar charts, and contour plots) to display or extract information related to environmental science.
- Students develop their online skills by making extensive use of online resource to acquire information, visualize data and concepts, and analyze the behavior of simple models related to environmental sciences.
- Students will analyze issues, claims, and situations related to environmental science using appropriate scientific methodology including data analysis and model simulations. They will identify information that is important to a specific problem from extraneous information and distinguish between fact and opinion.
- Identify the relationship between flows of energy or matter through the environment and stocks of energy or matter, Examples include the greenhouse effect, water cycle, air and water pollution, and world population

- Explain the current scientific understanding of natural and anthropogenic causes of climate change and the connection with our future.

Class Policies

Each student is expected to be courteous to others and observe the rules and regulations of the college at all times.

Class Participation

Each student is expected to do all class activities. The course is designed to provide scaffolding early in the quarter to build skills and knowledge needed later in the quarter. The exams will typically be based on topics that are included in readings, online quizzes, and labs. The Clark College faculty and administration agree that for every one hour in class students should be spending 2 to 3 hours outside of class working on learning activities (reading, writing, homework). With this in mind expect to spend approximately 15 to 17 hours a week on the course (150 to 170 hours for 10 week course). Don't fall behind, as it is very difficult to catch up. I've estimated that the [3 required summaries](#), [Term Project](#), and [Designing the Solar water Heater](#) are all estimated to take approximately 42 hours total. This means that readings, videos, labs, quizzes, and other homework is estimated to require about 9 to 11 hours per week additional time depending on your pace. Whenever possible, do things early.

It is important to maintain a safe learning environment by showing unconditional respect for others. One must be particularly careful when communicating electronically as often the written word can often be perceived differently than intended. This is demonstrated by being respectful of others and their opinions, taking one another seriously, and allowing humor to be a part of the class. Entering into class discussions and asking questions is important but try to be extra courteous to others and their opinions.

Make-up Policy To assess student understanding of reading, ideas presented in class, and laboratory activities periodic quizzes and exams will be given. No make-up exams or quizzes are given. Also late homework or labs will be given a maximum of 50 % if they are turned in (by hand) after the due date.

Withdrawals The withdrawal policy is published in the Clark College schedule of day & evening classes [Change of registration and withdrawals.](#) Please communicate with the instructor before withdrawing from the course as this action may not be necessary. * A class officially dropped before the tenth day of instruction will not be entered on your transcript. * After the tenth day and through the seventh week of the quarter, classes formally dropped will be posted to your transcript with a withdrawal grade of "W". * No withdrawals will be accepted after Friday of the seventh week of the quarter. **Withdrawal Appeals** Students unable to withdraw by the end of the seventh week of the quarter due to extenuating circumstances should contact the Dean's Office by the end of the last scheduled class day.

Safety is of utmost importance at all times. Since the laboratory environment can present unusual safety hazards the Science division has placed special emphasis on laboratory safety. Please be extra careful while in the laboratory and help us maintain safety, campus wide, by reporting any potentially hazardous situations immediately to the instructor. Also when doing field work for your term project drive carefully, take a partner with you, and never take risks just to get data. Your site selection should be chosen with safety in mind.

Academic Honesty is required at all times. Honesty during exams is essential at all times. Copyright laws, plagiarism rules shall be observed at all times. Plagiarism is representing another's work as your own, or recycling your work and representing earlier work as new work. Plagiarism will not be tolerated in this course and is grounds for failing the course.

Citizenship One of the Clark College campus abilities is **Effective Citizenship**. Always be courteous to yourself, other students, and the instructor. Respect the rights of others to have feelings and opinions that may be different than your own. All students are expected to follow the Clark College [Code of Student conduct.](#)

Extra Credit Student will be given some opportunity for extra credit which can increase their overall grade by up to 5 percentage points. If a student is interested in developing their own extra credit activity/research project related to a particular aspect of atmospheric science that is of interest to you please talk with your instructor. Writing summaries of papers, essays or books related to environmental science issues of particular interest to you are worth up to 1 % of your overall grade each. See [Paper Summary](#) for

guidelines and [articles](#) for some possible ideas. Students may also submit a YouTube video summary of the choice for up to 1 % extra credit. See [YouTubeVideo Summary](#) for more details

Disability Support Services -

(http://www.clark.edu/student_services/disability_support.php) If you have a disability and need an accommodation, please communicate this need to your instructor outside. A request for accommodation may require that documentation of the disability be reviewed by the Disability Support Services. DSS can be contacted at 360-992-2835 TTY, and are located in PSU 006. You need not disclose to me the specifics of any disability that you may have, but any accommodations must come through DSS and special accommodations are not retroactive. If you think you may need accommodations, please arrange for those at the beginning of the term.