

CHE 107
Chemistry of the Environment
Laboratory Syllabus – Spring 2007

INSTRUCTOR:

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Office Hours:

Wednesdays 10:30 – 12:00 PM, Thursdays 1:00 – 2:30 PM and by appointment

SCHEDULE:

You will meet once per week on either Tuesday or Wednesday (1:30 – 4:30 PM) in Martin 109 for your laboratory session. You are responsible for reading the experiment for that week BEFORE arriving in lab. You should arrive on time with the proper laboratory attire.

DESCRIPTION:

The goal of this course is to introduce students to the scientific method utilized in solving real world problems. To accomplish this goal, an experience has been developed in which students will be exposed to questions in a variety of environmental contexts or modules: *The Atmosphere*, *The Hydrosphere*, *The Geosphere*, *The Biosphere* and *Energy*. In the classroom, students will be introduced to relevant chemical, biological, geological and physical concepts in the context of issues associated with a region of the environment. In the laboratory, a) the students will be presented with an environmental scenario, b) sampling strategies will be discussed and deployed, c) samples and standards will be prepared and analyzed, d) data will be analyzed using appropriate software, e) results will be interpreted in the context of the original hypothesis and regulatory or literature values and f) reports will be written to a targeted audience. For example, in *The Atmosphere*, students might look at carbon dioxide concentrations as they contemplate global warming, particulate concentrations as they evaluate health impacts, and the effect of acidic solutions on materials as they debate the validity of concerns surrounding acid deposition. They will then report their results in the form of an article for the local newspaper.

Regardless of major, every student will graduate and become part of a society where resources are limited and interactions with the environment have ramifications. For the non-science major, this course will provide background and experience in applying scientific principles. The knowledge and skills gained in this course will be important in the future when they are called to interpret, understand and act on the information provided by government agencies, profit and non-profit groups and the media.

OBJECTIVES:

1. To develop hands-on activities in environmental sampling of air, water and soil.
2. To provide experience with laboratory techniques including gravimetric, titrimetric, spectroscopic, separations and electrochemical methods.
3. To develop students' ability to analyze and interpret data.
4. To provide an opportunity to evaluate results in the context of a larger issue.
5. To encourage presentation of results to a general audience.

MANUALS:

You have been provided with a laboratory manual for your personal use during the semester. In the spirit of environmental conservation, this laboratory manual is to be returned at the completion of the semester for reuse in subsequent years. Please refrain from marking in the lab manual. Electronic copies of each experiment are available on blackboard if you would like a personal copy. Copies of the data sheets will be provided for your personal use.

DATA SHEETS:

Included with each laboratory experiment is a packet of results and discussion sheets. These sheets are to be used to record data, calculations and interpretation of results. The data sheets are due at the beginning of the next lab period.

MODULE REPORTS:

At the completion of each module, you and your partner will be responsible for a summative report in layman's terms in the form indicated below. These reports are due before the beginning of your laboratory period the week following the completion of the module.

1. Atmosphere: Newspaper Article.
2. Hydrosphere: Report to the local governing body.
3. Geosphere: Report to the homeowner with recommendations to improve soil quality for its intended use (*i.e.* grass, garden, flower bed).
4. Biosphere: Poster.
5. Energy: Evaluative essay of current energy usage and recommendations to meet future needs.

ENVIRONMENTAL CONSULTING:

During the first week of class, you will be introduced to regional/state environmental issues. Each issue will be assigned to a group of four students. Using the scientific method as modeled in your laboratory experiments, the group will develop and research a series of questions that will provide insight into the complexities of the issue from a variety of perspectives/viewpoints. Your instructor and a reference librarian will be available to assist you in this process. Each member of the group will keep a journal to chronicle individual and group activities, findings and perceptions throughout the duration of the project. You will present your findings in the form of a written and oral report to the Town, City, County or State Governing Body as appropriate to your issue.

EVALUATION:

Consulting Report	50 points
Laboratory Data Sheets	120 points
Laboratory Module Reports	100 points

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES:

Full accommodations are the legal right of students with all kinds of disabilities, whether learning disabilities or physical disabilities. I am happy to provide these accommodations. If you are a student with a learning disability documented by Davidson College who might need accommodations, please identify yourself to me within the first week or two of class, so that I can learn from you as early as possible how to best work with your learning style. Students with other disabilities are also encouraged to self-identify if there is any way in which I can make accommodations that will enhance your learning experience. All such discussions will be fully confidential unless you otherwise stipulate.

HONOR CODE:

“Every student shall be honor bound to refrain from cheating (including plagiarism). Every student shall be honor bound to refrain from stealing. Every student shall be honor bound to refrain from lying about official College business. Every student shall be honor bound to report immediately all violations of the Honor Code, which come under his or her observation; failure to do so shall be a violation of the Honor Code. Every student found guilty of a violation of the Honor Code shall ordinarily be dismissed from the College for a period. Every member of the College community is expected to be familiar with the operation of the Honor Code.”

“All course work submitted for evaluation is pledged with the student’s signature: *On my honor, I pledge that I have neither given nor received help on this work, nor am I aware of any violation on the part of others.* In pledging, his or her work, the student affirms that any significant learning must be done within the boundaries of the pledge, that any knowledge falsely represented as one’s own is hollow and without merit.” (excerpted from the current College catalog announcements)

You are encouraged to work together in lab and on the reports. This work must be truly collaborative in nature. Your partner will be asked to evaluate your contribution as the semester progresses.

Blackboard <https://blackboard3.davidson.edu/>