

Instructor: Prof David Brandes
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Office Hours: MW 2:00-4:00

Class Meets: MWF 9:00 – 9:50 am AEC327. Tues 8:00-10:50 am or 1:10-4:00 pm AEC117

Required Texts: 1) Davis, M. L. and S. J. Masten. *Principles of Environmental Engineering and Science*. Third Edition. McGraw-Hill. 2014.
2) Silyn-Roberts H. *Professional Communications - A Handbook for Civil Engineers*. ASCE Press. 2005.
Additional required readings will be provided from time to time

Prerequisites: Mathematics 162, Chemistry 121, or permission of instructor.

Course Website: <http://sites.lafayette.edu/brandesd/courses/ce-321/>
This is the place to look for the course weekly schedule and other information

Course Moodle Site: <https://moodle.lafayette.edu> Handouts and homework assignments etc will be posted on the Moodle site – hard copies will not be supplied by the instructor.

Overview: CE 321 is the first of a series of required lab courses in each of the seven sub-fields (environmental, geotechnical, project management, structural, surveying, transportation, and water resources) of Civil Engineering. It is also a core course option for the Environmental Studies/Science programs. Environmental engineers seek practical solutions to a variety of societal challenges related to environmental pollution and sustainability. We will adopt a “watershed approach” to better understand connections between the various topics, focusing on the Bushkill Creek watershed near campus. Topics include watersheds and hydrology, sustainability, ecology, water chemistry, water supply and pollution control, and environmental risk. Laboratories consist of sample collection and analysis methods, field trips to local sites of interest, and computer modeling exercises.

Student Outcomes:

- 1) demonstrate an understanding of key concepts in chemistry, biology, hydrology, geology, and ecology that are fundamental to environmental engineering (3a);
- 2) apply science and engineering principles to a variety of environmental problems, including reactor modeling, nutrient transport, water/wastewater treatment (3a, 3e);
- 3) demonstrate fundamental civil engineering skills during the laboratory sessions, including observation and inspection, computer analysis, concept of uncertainty and laboratory and field testing (3b);
- 4) demonstrate effective written communication skills through a team-based poster project (3g);
- 5) demonstrate knowledge of contemporary/emerging issues in environmental engineering and appreciate the need to engage in life-long learning (3f, 3h, 3i, 3j);
- 6) demonstrate an appreciation for realistic design constraints within environmental engineering that address economic and sustainable engineering practices through class discussions tied to contemporary and emerging issues as well as numerous design problems (3a, 3c).

Grading:

Two mid-term evening exams:	30 %
Final exam:	15 %
Homework:	10 %
Laboratory*:	15 %
Poster Project:	20 %
Attendance, participation, effort (APE)**:	10 %

*Attendance is **required** at all laboratories. A zero will be given for any missed laboratories.

**More than *three absences* from class will result in a grade reduction

Mid-term and Final Exams: Each exam will cover only material up to the previous exam. However, some topics from earlier parts of the course provide the fundamentals for later material, and in that sense, the exams are comprehensive. **All exams are closed book and closed notes** - the best way to prepare is to study your class notes, homework problems, and lab exercises; an equation sheet will be provided if necessary. The exams are typically a combination of short answer questions and quantitative problems.

Homework: Assignments will be weekly/biweekly and will be due one week from the date assigned. Students are encouraged to work together on homework problems. (Note: working together does not mean copying – each student must do his/her own work!) Homework assignments are to be done in a neat, professional manner (i.e., on engineering paper or printed computer output) with solutions clearly explained - accompanied by supporting figures and graph when needed. Make sure that correct and consistent units are included with all numerical answers. It is also a good idea to check the "reasonableness" of your work after you are done your calculations and provide additional comment to answers that seem unreasonable (see Homework Guidelines). Homework is due at the beginning of class on the due date. Late homework or lab assignments will be accepted only if the student has made prior arrangements with instructor. There will be a grade penalty of 10% for each day (weekday or weekend day) an assignment is late.

Laboratory Exercises: Labs for this class include chemistry labs, field trips for sampling, and visits to local sites of interest (water treatment plant, wastewater treatment plant, landfill, etc.). A few of the labs may consist of computer exercises in the CE computer lab (AEC 302). A written report of some kind will be required for each lab; however this will not always be a formal lab report. I will provide a handout with detailed instructions at the beginning of the lab period, and the write-up will be due at the beginning of lab the following week.

Poster Project: Students will work in teams of three across multiple courses to research and report on an environmental engineering & science topic of current and/or local concern (theme for fall 2015 – “Human Health and the Environment”). Each team will create a professional quality poster and present work at a poster session at the end of the semester. At the session a number of students, faculty and outside experts will judge all posters. Additional information about the poster project is provided on a separate handout and Moodle site. Note that this project is worth more points than an exam!

Federal Credit Hour Statement - The student work in this course is in full compliance with the federal definition of a four credit hour course. Please see the Lafayette College Compliance webpage (<http://registrar.lafayette.edu/additional-resources/cep-course-proposal/>) for the full policy and practice statement.

Policy on Personal Communications Devices

It is great to live in the digital information age, but it is a fact that our brains are not very good at multi-tasking. In order to promote you getting the most for your tuition dollars and to prevent disruption of other students' learning environment, cell phones/smart phones *must be turned off* in class. If you disregard this policy, your attendance/participation/effort grade will be adjusted downward. You may bring a laptop to class so that handouts/readings etc. can be viewed electronically.

A Note on Academic Dishonesty

Academic integrity is a cornerstone of higher education and cheating is an insult to your instructor and classmates. The College has clear written policies on academic dishonesty (see the on-line Student Handbook, pages 7, 20, and Appendix II). Suspected cases of academic dishonesty dealt with according to College policy. Nonetheless, you are encouraged to work together to solve the homework problems, but do not just copy a classmate's solution - make sure you understand and produce your own solution. When writing your lab reports and poster projects, be very careful to cite sources! A source must be given for any figures, graphics, or pictures used in your work (except your own of course).

Article 1, Section 27 of the Pennsylvania Constitution:

"The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustees of these resources, the Commonwealth shall conserve and maintain them for the benefit of all people."

ASCE Vision for Civil Engineering in 2025:

"Entrusted by society to create a *sustainable world* and enhance the global quality of life, civil engineers serve competently, collaboratively, and ethically as master:

- planners, designers, constructors, and operators of society's economic and social engine — the built environment;
- *stewards of the natural environment and its resources*;
- innovators and integrators of ideas and technology across the public, private, and academic sectors;
- managers of risk and uncertainty caused by natural events, accidents, and other threats; and
- leaders in discussions and decisions shaping public *environmental* and infrastructure policy."