**Department of Earth and Atmospheric Science**

**EAS 56500 – ENVIRONMENTAL GEOPHYSICS**

**Syllabus for Fall, 2017**

**Designation:** Elective course for EAS, EESS, and ESE majors

**Catalog Description:**

The application of geophysics to environmental and engineering problems. Hands-on work and demonstrations of seismic, electrical, electromagnetic, and magnetic instruments and techniques. Survey design and execution. Computer analysis of survey results.

**Hours/Credits:** 3 hours lecture, fieldwork, or computer class per week; 3 credits

**Text:** Burger, Sheehan, and Jones, Introduction to Applied Geophysics, W.W. Norton and Co., 2006; also various supplementary readings, xeroxed or available on Blackboard

**Topics covered:** See attached schedule.

**Course Objectives:**

After completing this course, students should be able to:

1. Understand the principles underlying the geophysical surveying methods most commonly used in environmental applications.

2. Design a simple survey to answer a question about the shallow subsurface.

3. Correctly set up and operate the equipment covered.

4. Work with a group to take geophysical data.

5. Use simple computer programs to analyze geophysical data.

6. Write the report of a geophysical investigation.

**Grading:** There will be a final exam, given during finals week, which will count 25% of your grade. The remainder of your grade will be based upon your performance on the problem sets, computer assignments, and field reports which will be assigned during the semester. In cases where the grade, calculated based on your written work, is on the border between two letter grades, your grade may also depend on your participation in fieldwork and group problem-solving.

**Late Assignments:** Each report or other assignment will be given a due date. An assignment that is turned in after the due date will be assessed a penalty of half a letter grade for each week that it is late.

**Absences:** Each class in this course encompasses a whole week of work. In addition, there are some classes, notably those involving fieldwork, that are impossible to make up. Therefore, you should make a serious effort to attend every class. If this is absolutely not possible, due to an emergency or significant illness, then makeup assignments will be required for the missed class or classes. Note, however, that missing more than two classes may result in a grade of **WU** for the semester, depending on the material missed.

**Grad Students:** This course is co-listed with a graduate course at City College. The grad students will attend the same lectures and fieldtrips as the undergraduates, but they may be required to stay after some classes for additional instruction. Also, the grading in the graduate course will differ from the undergraduate course. There will be a different final exam, differences in the homework, and differences in the sophistication and the number of components required in the field reports. Details will be given in class.

**Instructor and**  Dr. Patricia Kenyon – 933 Marshak Science Building

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**Office Hours:** The half hour before class, or TuTh, 2 PM – 4 PM, other times by appointment

**Academic Integrity:**

Although we will be taking data as a group, it is expected that all written work turned in this course will be done independently, unless explicitly stated otherwise in the assignment. Cheating or plagiarism of any kind will not be tolerated. Cases where academic integrity is compromised will be handled in accordance with the CCNY Policy on Academic Integrity. A statement of this policy can be found on the CCNY website under Academics/Academic Standards.

**TENTATIVE 2017 SCHEDULE – ENVIRONMENTAL GEOPHYSICS**

**DATE TOPIC**

Aug. 25 Introduction, Data Analysis and Modeling in Geophysics

Sept. 1 Seismic Prospecting for Shallow Targets

Sept. 8 Seismic Fieldwork

Sept. 15 Analysis of Seismic Data

Oct. 6 Use of Electrical Resistivity for Environmental Targets

Oct. 13 Resistivity Fieldwork

Oct. 20 Analysis of Resistivity Data

Oct. 27 Ground Conductivity and Electromagnetic Methods

Nov. 3 Ground Conductivity Fieldwork (EM-31)

Nov. 10 EM-31 Data Analysis and Additional EM Methods

Nov. 17 Potential Field Methods in Environmental Work

Nov. 21 Magnetic Fieldwork

Dec. 1 Analysis of Magnetic Data

Dec. 8 Borehole Geophysics and Review for Final