Introduction to Urban Environmental Analysis

PLAN6009

Introduction to Environmental Analysis

Fall 2017

Thursday, 9:00 – 11:00 am

Avery Hall, rm 408

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Adjunct Professor

Description

The urban environmental analytics course will focus on urban energy. There are substantive and analytic goals to the class. The substantive goals are to introduce students to: 1) Key physical and infrastructural features of contemporary energy systems; 2) The economic, social, environmental, and policy issues raised by current energy usage; and 3) Energy assessments and scenario development. The analytic goals of the course are to: 1) Generate energy assessments and scenarios at the urban scale.

Expected outcomes

By the end of the semester, you will have knowledge of the distribution of primary energy resources, the different conversions these sources undergo to end use and the social implications of our energy use trends, the environmental impacts of energy use and the challenges to making the system sustainable. Analytically, students will be able to:

- Find and download energy data;
- Perform analysis (aggregate, average, calculate annual increases, etc.) with these data;
- Input data into the LEAP software to generate a cost-benefit analysis, least-cost analysis and generate scenarios.

Student evaluation

Evaluations are based upon:

- Class attendance and participation. Participation in class discussion is vital. As mentioned, a significant portion of class time is devoted to discussion of readings and class lectures;
- The completion of in-class assignments. Each student will be required complete 4-6 training exercises that will introduce them to analysis software (Excel, LEAP, other). These assignments will be started during class time every other week. Student will need to run analyses and produce output as per given input data.
- Students will prepare an original scenario based upon data they collect during the semester. They will provide analysis and report the output in a final paper. The paper should be approximately 2-3,000 words including bibliography, tables and figures.
- Finally, on the last day of class, students will present their research to the rest of the class.

Class activity	Percent of final grade	Due date
Class participation	20%	Throughout
Assignment 1 – In-class assignments	20%	Throughout
Assignment 2 – Paper related to seminar session	50%	11 December
Assignment 3 – Final presentation	10%	30 November

Required texts

- D. Danny Harvey (2010) *Energy Efficiency and the Demand for Energy Services* London & Washington, DC: Earthscan Press
- LEAP Long-range Energy Alternative Planning System Training Exercises, Stockholm Environment Institute, 2016 (in pdf on Courseworks).

Office hours and classroom policies

I am available for discussion most Thursdays. I do not, however, have an office here on campus, so we will meet in common spaces at Columbia. Note that while I respond to email as promptly as possible, if you send me an email late on Friday I may not respond until Monday.

During class time, please turn off your phones and do not bring/use earphones.

Academic integrity

Columbia University regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The University is committed to enforcing its Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Academic Integrity Procedures. Plagiarism, dishonesty, or cheating in any portion of the work required for this course will be punished to the full extent allowed according to Columbia University College regulations.

Essential class policies

There are no incompletes given for the course with the exception of a proven medical emergency. No late exams are accepted. You will receive a grade of "0" on any exam not taken if you do not have a documented medical excuse for missing the exam. I take attendance as I believe that class participation is an important part of your grades. If you email me during the week, you can expect a return email within 36 hours. I may not answer during the weekends. Please do not bring iPods or earphones to class and do not use your cell phones or laptop computers except to take notes. Please do not bring food to class.

Course Schedule (tentative)

The course will follow the textbook as outlined by the chapter plan below. Each chapter in the main text (*Energy Systems and Sustainability: Power for a Sustainable* Future) will be covered within approximately one week by two lectures (with some exceptions).

Week of	*Lecture focus and readings*
6 September	Welcome
13 September	Chapter 1 Prospective climatic change
20 September	Chapter 2 Energy basics, usage patterns and trends
27 September	Chapter 3 Generation of electivity from fossil fuels
4 October	Chapter 4 Energy use in buildings
11 October	Chapter 5 Transportation energy use

18 October	Chapter 6 Industrial energy use
25 October	Chapter 7 Agricultural and food systems energy use
1 November	Chapter 8 Municipal services
8 November	Chapter 9 Community-Integrated energy systems
15 November	Chapter 10 Energy demand scenarios
22 November	Thanksgiving
29 November	Chapter 11 Policies to reduce the demand for energy
6 December	Student Presentations