

Methods of data collection, analysis, representation, and modeling in Environmental and Social Sciences

Winter, 2018

Course Number: ESM 333 & ESM 334

CRN: 44997 & 44998

ESM 333: 11:30 – 13:20, Mon & Wed, SB1-424

ESM 334: 14:00 – 15:50, Mon, SB1-424

Instructor: Meenakshi Rao, Ph.D.

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Office Hours: 13:30 – 14:30pm, Wed, SB1-424

Or by appointment

Lab Instructor: Kaegan Scully-Engelmeyer

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Course Overview

Environmental data is an important part of our daily lives. We use environmental data to make decisions at the daily, personal level (carry an umbrella, snow conditions for skiing) to policy decisions at the national and global scales (Kyoto Protocol). In this class we take a peek under the hood and look at the methods and tools that are used to transform environmental data into *information* that drives our decisions - big and small. The lab associated with the class will give you hand-on experience with some of the tools and methods; while the final project for the class will give you an opportunity to put these skills to practical use. The class will also help you develop skills to blog about environmental data and develop a personal portfolio website.

Weekly class work will include a mix of reading, blogging, discussions, and hands-on activities.

Learning Goals

1. Understand the methods and tools used to transform data into information.
2. Be able to effectively communicate and critique environmental information.
3. Be able to showcase personal understanding of the environmental data life cycle through a project and personal portfolio web page.
4. Be able to explore and discuss ethical and/or political issues in an online forum.

Text/Readings

Students are required to attend the UERC Symposium on 5th Feb. Registration is \$15 for the full-day conference. Registration includes lunch if you register before 15th Jan.

Registration: <http://www.uercportland.org/>

Other readings and materials will be posted to the class D2L site.

Assignments & Projects

There are two grades for this class: one for the lecture portion of the class, and one for the lab. The lab grade will be based on the completed lab work.

In addition to class attendance, the lecture grade will be based on:

1. *Participation*
Participation will be assessed on contribution to class discussions, and in-class activities.
2. *Weekly assignments*
Students are required to maintain a blog and follow the blogs of their classmates.
3. *Mid-term assignment*
Students will give a 5-minute presentation on the UERC Symposium.
4. *Final assignment*
The final assignment will be a group project working with environmental data set(s).

Weekly blogging and comments	30%
UERC report and 5-min presentation	20%
Final - group (data collection, analysis, presentation)	30%
Participation	20%

Expectations

- Students are expected to attend all classes.
- Late assignments will not be accepted without prior arrangement with me.
- Please read and abide by the PSU Code of Conduct. <https://www.pdx.edu/dos/psu-student-code-conduct>

Miscellaneous

When emailing me, please include the course, your last name and a clue about your purpose in the subject line (for example, if you were writing with a question about an assignment, you might write, "ESM 333: Smith week 5 assignment question" in the subject line).

If you have a learning or physical disability, please contact the Disability resource Center for approval to request accommodation.

Course Schedule

The course schedule below is very highly tentative and incomplete. I hope to tailor the class topics to your needs and interests.

Mon	Lecture1	Mon	Lab	Wed	Lecture2
8-Jan	What is data? Class overview	8-Jan	Setup Wordpress blog	10-Jan	Public data sets; data formats HTML/CSS
15-Jan	holiday - MLK Day	15-Jan	holiday - MLK Day	17-Jan	Data collection methods
22-Jan	Tools for data collection and storage, design collection format for noise data	22-Jan	noise data	24-Jan	databases (hands on)
29-Jan	Data exploration	29-Jan	Interactive mapping with leaflet.js	31-Jan	Copyright, data privacy, security, etc.
5-Feb	UERC	5-Feb	UERC	7-Feb	UERC debrief/5 min presentation
12-Feb	Data analysis - methods, tools	12-Feb	R: Intro to dataframes	14-Feb	Data analysis - methods, tools, modeling
19-Feb	Data sharing - communication, visualization	19-Feb	R: Intro to ggplot	21-Feb	Putting it all together
26-Feb	project planning	26-Feb	QGIS?	28-Feb	project
5-Mar	project	5-Mar	project	7-Mar	project
12-Mar	project	12-Mar	project	14-Mar	group presentations
19-Mar	Final exams week				