

Syllabus

ENS 623: Research and Statistical Methods

Course Number: ENS 623

Credits: 3

Professor: Dr. Matthew Aiello-Lammens

Meeting day and time: Wed 5:40 - 8:40 PM

Term: Spring 2018

Location: Environmental Center Classroom

Course description

This course covers issues related to the proper manner in which develop and conduct a research project. Statistical issues related to environmental evaluations will be discussed, including minimal detectable levels proper sample size, and determination of proper methods for evaluation of data, using both parametric and nonparametric procedures.

Rationale

Scientists need to analyze data in order to evaluate hypotheses and extract further insights from their observations. Further, the ability to analyze data collected during fieldwork is a key component of effective science communication. This course will provide students with these techniques. Additionally, the methods of biostatistical analysis are applicable in all fields relating to science, whether they are applied directly when analyzing data or indirectly by providing a structure to interpret scientific findings.

Learning objectives

- How to perform exploratory data analysis.
- How to evaluate data quality.
- Methods to visualize patterns in data.
- How to perform standard data analysis techniques, including linear regression, ANOVA, and generalized linear modeling.
- How to identify the most appropriate analysis techniques to use with a given dataset.
- How to use knowledge of standard data analysis techniques to effectively choose and apply more advanced methods.

Assessment

I will assess your achievement of the learning objectives based on your performance on problem sets, inclass exams, and a final analysis report.

Problem sets - 60%

Semester project - 40%

Analysis project

The written analysis report will be a document that describes the methods used to collect and analyze your data, your results, and all figures and tables associated with the analysis.

Required materials

- Logan. 2010. Biostatistical Design and Analysis Using R: A Practical Guide. Wiley-Blackwell
- Quinn and Keough. 2009. Experimental Design and Data Analysis for Biologists. Cambridge Press

Data sets

- Logan (2010) datasets can be found [here](#).

Course Policies

Attendance

Attendance and punctuality are required. Excused absences will be considered, but must be discussed with Prof. Aiello-Lammens. Unexcused absences and/or consistent lateness will negatively impact a student's final assessment and could result in failure.

Technology in the Classroom

Use of computers and tablets may be necessary to complete some in-class assignments. However, I expect you to be respectful and professional, and not to be "surfing the internet" during class. If I witness this activity, you will not be allowed to use technology in the classroom thereafter.

Academic Integrity

All members of the Pace community are expected to behave with honesty and integrity, as outlined in Academic Integrity Code. The following statement is from the Student Handbook:

Students are required to be honest and ethical in satisfying their academic assignments and requirements. Academic integrity requires that, except as may be authorized by the instructor, a student must demonstrate independent intellectual and academic achievements. Therefore, when a student uses or relies upon an idea or material obtained from another source, proper credit or attribution must be given. A failure to give credit or attribution to ideas or material obtained from an outside source is plagiarism. Plagiarism is strictly forbidden. Every student is responsible for giving the proper credit or attribution for any quotation, idea, data, or other material obtained from another source that is presented (whether orally or in writing) in the student's papers, reports, submissions, examinations, presentations and the like.

Individual schools and programs may have adopted additional standards of academic integrity. Therefore, students are responsible for familiarizing themselves with the academic integrity policies of the University as well as of the individual schools and programs in which they are enrolled. A student who fails to comply with the standards of academic integrity is subject to disciplinary actions such as, but not limited to, a reduction in the grade for the assignment or the course, a failing grade in the assignment or the course, suspension and/or dismissal from the University.

Accommodations for students with disabilities

The University's commitment to equal educational opportunities for students with disabilities includes providing reasonable accommodations for the needs of students with disabilities. To request an accommodation for a qualifying disability, a student must self-identify and register with the Coordinator of Disability Services for his or her campus. No one, including faculty, is authorized to evaluate the need and arrange for an accommodation except the Coordinator of Disability Services. Moreover, no one, including faculty, is authorized to contact the Coordinator of Disability Services on behalf of a student. For further information, please see Information for Students with Disabilities on the University's web site.

To receive accommodation for any disability, students must contact the campus Counseling Center (Pace Plaza, 212-346-1526; Westchester, 914-773-3710).