Course Outline

EST 603

RESEARCH METHODS & DESIGN

Mary B. Collins & David A. Sonnenfeld
Department of Environmental Studies

SUNY College of Environmental Science and Forestry
Fall 2016, TuTh 9:30-10:50 am, Bray 300

DESCRIPTION

Overview

This course is the first in a two-course sequence focused on research methods for interdisciplinary environmental studies, with emphasis on the environmental social sciences. Material covered in EST 603 provides foundational preparation to use a wide range of research methods and design strategies, including survey research methods, which is the focus of the second, follow-up course in the sequence, EST 604. Designed especially for first-semester MS in Environmental Studies students, all masters and PhD students with a human dimensions or policy aspect to their research are welcome to participate. Topics include the scientific method; research ethics; research design; measurement; sampling; quantitative, qualitative, and mixed data collection techniques; data analysis and interpretation; and proposal development. Students learn how to define a research question; explore the strengths and limitations of a variety of social science research methods; gain practical experience in research design, data collection and analysis; and draft a group research proposal.

Prerequisites

While there are no formal prerequisites for this course, prior or concurrent coursework in statistical analysis is recommended.

Objectives

By the completion of this course, students should be able to:

- Define a research question, clearly and succinctly;
- Determine appropriate levels and units of analysis for your research question;
- Locate and review relevant peer-reviewed, scholarly literature on a selected question;
- Critique, understand, and apply prior, related research;
- Operationalize a research question, specifying dependent and independent variables;
- Select appropriate method(s) for studying various types of research questions;
- Draft a group research proposal; and
- Demonstrate familiarity with campus policies for the protection of human subjects, including Institutional Review Board (IRB) procedures.
Requirements

- Attend all class sessions
- Read all required texts
- Participate in all class discussions
- Complete all homework assignments, including online training modules on the protection of human subjects
- Contribute to the writing of a group research proposal
- Complete a short, reflective essay on your contribution to the group research proposal

Grading

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework assignments</td>
<td>30%</td>
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<tr>
<td>Mid-term exam</td>
<td>30%</td>
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<tr>
<td>Group research proposal &amp; presentation</td>
<td>25%</td>
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<tr>
<td>Attendance, participation, and reflection</td>
<td>15%</td>
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Communication

MARY COLLINS
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DAVID SONNENFELD
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TEXTS

Required


+ Readings from scientific journals, public/health agencies, NGOs, and the popular press related to our case study: environmental exposures to elemental lead, health effects, and social inequality

Recommended

Bookstore

ESF Virtual Bookstore, available via myESF. For further information see: http://www.esf.edu/students/books.htm

LIBRARY GUIDE

http://libguides.esf.edu/est603

SCHEDULE

PART I: SCIENCE IN CONTEXT

Week 1 – Interdisciplinary Environmental Social Science

Tues., 8/30: Course introduction

Why study research methods?
Aims of this course
Assumptions
Syllabus review
REQUIRED:
Singleton & Straits, Approaches to Social Research, preface, ch 1
Öberg, Interdisciplinary Environmental Studies
ADDITIONAL:

Thurs., 9/1: Case study overview: lead, health, inequality

Lead, health, and inequality general background
Lead, health, and inequality in Syracuse
Lead, health, and inequality research efforts and course preview
Overview of group-based research project
REQUIRED:
An initial sampling of readings presenting an introduction and overview on the topic of environmental exposures to elemental lead, health effects, and social inequality:
Week 2 – Philosophical, Ecological, and Policy Contexts

**Tues., 9/6: The scientific method**

- In historical perspective
- Scientific revolutions (Kuhn)
- Strengths, limitations & critiques

**REQUIRED:**
Singleton & Straits, *Approaches to Social Research*, ch 2

**RECOMMENDED:**
Kuhn, *Structure of Scientific Revolutions*

**ADDITIONAL:**

*** Homework Assignment #1 – Essay: Why Science? (due Tues., 9/13) ***

**Thurs., 9/8: Case study: ecological and policy context**

- Guest lecture by local lead/ health effects policy analyst (TBA)
- Walking tour of Syracuse residential neighborhood (TBA)

**REQUIRED:**
A sampling of readings from a policy perspective on the topic of environmental exposures to elemental lead, health effects, and social inequality, including:

**RECOMMENDED:**
Best, *Damned Lies and Statistics*

Week 3 – The Intellectual Context

**Tues., 9/13: Selecting a problem or topic**

- The relationship between theory and method
- What makes a problem/ topic interesting?
- What is researchable? Feasibility...
- The 'so what?!' factor
- The value of simplicity

**REQUIRED:**
Singleton & Straits, *Approaches to Social Research*, ch 4
ADDITIONAL:

**Thurs., 9/15: Scholarship on lead, health, and inequality**

Guest lecture by local lead/ health effects scholar (TBA)

Summary of scientific issues

Review of scientific issues, debates, gaps

Critical review of media coverage of science on this topic

REQUIRED:
Further readings from a variety of sources including also the popular press on environmental exposures to elemental lead, health effects, and social inequality, including:


RECOMMENDED:

Best, *Damned Lies and Statistics* (review)

*** Homework Assignment #2 – Preliminary Problem Definition (due Tues., 9/27) ***

**Week 4 – The Ethical Context**

**Tues., 9/20: Protecting human subjects**

Who are 'human subjects'? (definition)

Why do they need protection, and from whom?

How are they protected, and by whom?

Federal guidelines and regulations, incl. the Belmont Report

Professional codes of conduct

SU/ ESF Institutional Review Board procedures

REQUIRED:
Singleton & Straits, *Approaches to Social Research*, ch 3

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*** Homework Assignment #3 – Complete SU/IRB CITI training (due Thurs., 9/22) ***

**Tues., 9/22: Workshop: research ethics**

GUEST SPEAKER:

TBA, Office of Research Integrity and Protections, Syracuse University

REQUIRED:

Collaborative Institutional Training Initiative (CITI) Web-based Training Program, available via on-campus access of the website of Syracuse University's Office of Research Integrity and Protections. Estimated duration: 2-6 hrs. *Must be completed prior to class; bring copy of completion certificate.*

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**PART II: RESEARCH DESIGN**

**Week 5 – Units of Analysis & Variables**

**Tues., 9/27: Levels and units of analysis**

Research stages
Levels of analysis; levels of abstraction
Units of analysis
Ecological fallacy

REQUIRED:

Singleton & Straits, *Approaches to Social Research*, ch 4

ADDITIONAL:


**Thurs., 9/29: Variables and relationships**

Variables
Types of variables
Relationships between variables
Formulating research questions and hypotheses

REQUIRED:

Singleton & Straits, *Approaches to Social Research*, ch 4

ADDITIONAL:


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*** Homework Assignment #4 – Problem Definition Elaboration (due Thurs., 10/6) ***

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Week 6 – Measurement and Sampling

**Tues., 10/4: Measurement**

- Concepts
  - The measurement process
  - Operationalization
  - Levels of measurement
  - Reliability
  - Validity
- Application (Case Study)

**REQUIRED:**
Singleton & Straits, *Approaches to Social Research*, ch 5

*** Homework Assignment #5 – Proposed terms of reference (due Tues., 10/11) ***

**Thurs., 10/6: Sampling**

- Concepts
  - Defining the population of interest
  - Sampling and case study approaches
  - Data analysis and interpretation
  - Sampling bias
  - Generalization
- Application (Case Study)
  - Review and critique prior studies, re: sampling
  - Biophysical sampling

**REQUIRED:**
Singleton & Straits, *Approaches to Social Research*, ch 6

**ADDITIONAL:**

Week 7 – Intermezzo: project design and checkpoint

**Tues., 10/11: Research design & the case study**

- Work groups
  - Proposed terms of reference (*Homework Assignment #5*)
    - Problem definition
    - Conceptual understanding of the coupled human-natural system
  - Levels and units of analysis
Variables
Measurement
Sampling

Group presentations

_Thurs., 10/13: Midterm exam_
Individually based, on required readings, including application (case study)
*** Bring pencils and an eraser ***

**PART III: METHODS IN ACTION (*** draft ***)**

**Week 8 – Overview/ Experimental Methods**

_Thurs., 10/18: Overview of research methods_
Overview of research methods
Quantitative (multivariate) methods
Qualitative (interpretive) methods
Using available data
Multimethod and applied research methods
 REQUIRED:
Singleton & Straits, _Approaches to Social Research_, ch 1 (review)

ADDITIONAL:

_Thurs., 10/20: Experimental methods/ lead and health case study_
Overview of experimental methods
Natural experiments
Lead and health case study
Epidemiology of lead and health
Mitigation/ amelioration program evaluation
 REQUIRED:
Singleton & Straits, _Approaches to Social Research_, ch 8
+ TBA

*** Homework Assignment #6 – Experimental methods (due Tues., 10/25) ***
Week 9 – Survey Research Methods

Tues., 10/25: Survey methods overview

General features of survey research
Uses and limitations of surveys
Survey research designs
Steps in and forms of survey research
Administering surveys

REQUIRED:
Singleton & Straits, *Approaches to Social Research*, ch 9

*** Homework Assignment #7 – Survey research methods (due Tues., 11/1) ***

Thurs., 10/27: Survey methods: lead and health case study

Designing and developing a survey
Types of questions
Pretesting

REQUIRED:
Singleton & Straits, *Approaches to Social Research*, ch 10

RECOMMENDED:
Singleton & Straits, *Approaches to Social Research*, ch's 15-16

ADDITIONAL:

Week 10 – Analysis of Available Data

Tues., 11/1: Existing data overview

Discourse/ content analysis
Comparative historical analysis
Case-study based research
What is a case?

REQUIRED:
Singleton & Straits, *Approaches to Social Research*, ch 12

RECOMMENDED:

ADDITIONAL:

*** Homework Assignment #8 – Available data (due Tues., 11/8) ***
Thurs., 11/3: Existing data: lead and health case study
TBA

Week 11 – Field Research Methods

Tues., 11/8: Qualitative field methods overview
Participant observation/ethnographic research
Participatory action research
REQUIRED:
Singleton & Straits, Approaches to Social Research, ch 11
RECOMMENDED:
Wilmsen, et al., Partnerships for Empowerment
ADDITIONAL:

*** Homework Assignment #9 – Qualitative field research (due Tues., 11/15) ***

Thurs., 11/10: Qualitative field methods: lead and health case study
TBA

Week 12 – Policy Analysis

Tues., 11/15: Policy analysis overview
TBA

*** Homework Assignment #10 – Policy analysis (due Tues., 11/29) ***

Thurs., 11/17: Policy analysis: lead and health case study
TBA

THanksgiving Break

Week 13 – Integrative Approaches

Tues., 11/29: Systems and multimethod research
Systems approaches
Mixed research methods
Applied research methods
Meta-analysis
REQUIRED:
Singleton & Straits, Approaches to Social Research, ch 13
ADDITIONAL:

**Thurs., 12/1: Reporting research results**
General and specific to lead, health, and social inequality

**Week 14 – Group Presentations/ Discussion**

**Finals Week – Final Products Due**
- Group research proposals
- Individual reflective essays

**NOTICES**

**Accommodations**
SUNY-ESF works closely with the Office of Disability Services (ODS) at Syracuse University in assisting students with learning and physical disabilities. If you believe that you need accommodations for a disability, you may contact the ESF Office of Student Affairs, 110 Bray Hall, tel. 315.470.6660, for assistance with the process. You may also contact ODS directly, Room 309 of 804 University Avenue, 315.443.4498, to schedule an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible for coordinating disability-related accommodations and will issue students with documented Disabilities Accommodation Authorization Letters, as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible. To learn more about ODS, visit http://disabilityservices.syr.edu.

**Academic Integrity**
*Plagiarism* is presenting others' work as your own without properly acknowledging its source(s). Plagiarism includes verbatim and close paraphrasing of material from course texts and other published materials, cutting and pasting from electronic sources, and unattributed paraphrasing. Acts of academic dishonesty are defined in the *ESF Academic Integrity Handbook* and violate the College's *Code of Student Conduct*. Students are accountable for such acts. If you have any questions about how to properly use & cite others' original work, please consult writing reference texts, your instructor, or other campus resources.

**Personal electronics**
This course is intended to be an educational experience for all. To ensure that the classroom environment is conducive for learning, please follow these guidelines in use of personal electronics: *Cell phones* should be *off* while class is in session. (If, due to a personal emergency, you need to maintain your phone on silent
mode, please notify the instructor in advance.) *Laptops, tablets, e-readers,* etc. may be used for reading, note-taking, and course-related research activities. Unless directly related to course activities, *text messaging, social media viewing,* etc., during class is considered disruptive and not permitted.

**Fire Alarm Procedures**

If a fire alarm sounds, exit the building immediately to the designated area for this course. Stay together as a class, until released. Take all personal belongings with you, including electronics, backpacks, coats and keys. Please let your instructor know in advance if you might have any special needs in case of a building evacuation. For further information, contact the Office of Student Affairs, tel. 315.470.6660.