UNU Institute for the Advanced Study of Sustainability (UNU-IAS*)*
Spring 2019 Semester-Competency Course

As of 20 January 2019

Title of Course: Environmental Statistics and Research Methods (ESRM)

Coordinators: Osamu SAITO
Course Schedule: From 10 April until 3 July, 2019

Purpose and learning outcomes: The purpose of this course is to understand basic skill to analyze environmental and social data, and to learn practical research methods and skills that would be useful throughout a research operating cycle, including problem identification, field survey, interpretation, academic writing, and dialogue with end-users (policy makers, private sectors and citizen). Environmental investigation often covers a broad range of disciplines of social science to natural science. Since the systems under environmental study are complex, statistical methods are important techniques in the interpretation of project results. By the end of the course, each student is expected to familiar with basic statistical methods and common research methods to apply them to their own thesis research.

Course Outline

Lecture	Date	Content	Instructor
Lecture 1	04/10 (Wed), 11:00-12:30	- Course Guidance - Project Design (Chap.1)	Saito, O.
Lecture 2	04/17 (Wed), 11:00-12:30	Describing data (Chap.2)	Saito, O.
Lecture 3	04/24 (Wed), 11:00-12:30	Using Statistics to answer questions (Chap.3)	Saito, O.
Lecture 4	05/08 (Wed), 11:00-12:30	Difference between two samples (Chap. 4)	Saito, O.
Lecture 5	05/08 (Wed), 14:00-15:30	Relationship between variables (Chap. 5)	Saito, O.
Lecture 6	05/15 (Wed), 11:00-12:30	Analyzing frequency data (Chap. 6)	Saito, O.
Lecture 7	05/22 (Wed), 11:00-12:30	Qualitative analysis methods (I) - Qualitative Research Design - Qualitative Methods: Theory Building Methodology, Visual Etnography - Qualitative Data Analysis: Nvivo Software for Data Analysis	Isabel B. Franco
Lecture 8, 9	05/29 (Wed), 11:00-15:30	- Using statistics software (R or STATA) and multivariate statistics including hands-on session - Description of the data and analysis methods - Examples of multivariate regression	Geetha Mohan
Lecture 10	06/06 (Thu) 11:00-12:30	Qualitative analysis methods (II) - Overview: the nature and scope of qualitative	Mizan Bisri

		research - Common qualitative methods and research examples	
Lecture 11	06/12 (Wed), 18:00-19:30	Qualitative analysis methods (III) - Stakeholder Analysis - Joint Fact Finding	Matsuura, M.
Lecture 12	06/19 (Wed), 11:00-12:30	Social network analysis: methods and case studies	Leticia dos Muchangos
Lecture 13	06/19 (Wed), 14:00-15:30	Peer-review process and academic writing - Selection of journal and types of manuscript - Peer-review and editorial process - Common reasons of rejection - Common mistakes and tips for scientific writing	Saito, O.
Lecture 14	06/26 (Wed), 11:00-12:30	Wrap-up feedback session	All lecturers
Lecture 15	07/03 (Wed), 11:00-12:30	Final exam	Saito, O.

Assessment:

- Class participation: 30%
- Assignments: 20%
- Final exam: 50%

Text books and reading materials:

- C. Philip Wheater & Penny A. Cook (2000): *Using Statistics to Understand the Environment*, Routledge.
- Peter J. A. Shaw (2003) *Multivariate Statistics for the Environmental Sciences*, Arnold.
- P.K. Ramachandran Nair & Vimala D. Nair. (2014): S*cientific Writing and Communication in Agriculture and Natural Resources*, Springer.
- Andrew J. Friedland and Carol L. Folt (2000): *Writing successful science proposals (second edition)*, Yale University Press, New Haven & London.
- Wayne C. Booth, Gregory G. Colomb and Joseph M. Williams (2008): *The Craft of Research (Chicago Guides to Writing, Editing, and Publishing)*, Univ of Chicago Press.
- John M. Swales and Christine B. Freak (2012): *Academic Writing for Graduate Students: Essential Tasks and Skills (Michigan Series in English for Academic & Professional Purposes)* (3rd Edition), Univ. of Michigan Press.
- J. W. Crewel (2014): *Research Design, Qualitative, Quantitative, and Mixed Methods Approaches* (4h Edition). Sage Publication
- L. Richards (2015): *Handling Qualitative Data: A Practical Guide* (3rd Edition). Sage Publication.
- P. Bazeley and K. Jackson (2013): *Qualitative Data Analysis with NVIVO* (2nd Edition). Sage Publication.
- Yin, R. K. (2012): *Applications of case study research*. Thousand Oaks, CA: Sage.
- Wolcott, H. T. (2008): *Ethnography: A way of seeing*. Walnut Creek, CA: AltaMira.
- Becker, H. S. (1998): *Tricks of the trade: How to think about your research while you are doing it*. University of Chicago Press.
- Strauss, A., & Corbin, J. (1998): *Basics of qualitative research: Grounded theory procedures and techniques*. Thousand Oaks, CA: Sage.

- Clandinin, D. J., & Connelly, F. M. (2000): *Narrative inquiry: Experience and story in qualitative research*. San Francisco: Jossey-Bass.
- Moustakas, C. (1994): *Phenomenological research methods*. Thousand Oaks, CA: Sage.