

UNU Institute for the Advanced Study of Sustainability (UNU-IAS)
Spring 2016 Semester-Competency Course

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

Coordinators: Osamu SAITO

Course Schedule: From 14 April until 30 June, 2016

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	04/14 (Thu), 14:00-15:30	- Course Guidance - Project Design (Chap.1) - Writing research proposal and launching a research project:	Saito, O.
Lecture 2, 3	04/21 (Thu), 14:00-17:30	- Developing conceptual frameworks and flow chart/diagram - Describing data (Chap.2) - Using Statistics to answer questions (Chap.3)	Saito, O.
Lecture 4	04/28 (Thu), 14:00-15:30	Field trip to Statistical Museum (Shinjuku, Tokyo)	Saito, O.
Lecture 5, 6	05/12 (Thu), 14:00-17:30	- Difference between two samples (Chap. 4) - Relationship between variables (Chap. 5)	Saito, O.
Lecture 7, 8	05/19 (Thu), 11:00-15:30	Using R software and Multivariate Statistics	Kamiyama, C.
Extra session	05/26 (Thu), 14:00-15:30	Extra hands-on session on R software	Kamiyama, C.
Lecture 9, 10	06/02 (Thu), 11:00-15:30	Qualitative analysis methods (I) Lecture 9: Overview: the nature and scope of qualitative research - Differences b/w qualitative and quantitative research approaches - Advantages, general framework and analytical objectives of qualitative research - Common qualitative methods - Sampling in qualitative research	Sato, A.

		Lesson 10: Common qualitative methods and research examples - Review of each qualitative method and examples - Designing questions and techniques for interviews and focus groups	
Lecture 11,12	06/09 (Thu), 14:00-17:30	Qualitative analysis methods (II) - Delineation of a community - Ethnographic case study methods - Participatory diagnosis methods - Writing about a community as a case study	Saito, O. & Otsuki, K.
Lecture 13	06/16 (Thu), 14:00-15:30	Qualitative analysis methods (III) - Stakeholder Analysis - Joint Fact Finding	Matsuura, M.
Lecture 14	06/23 (Thu), 14:00-15:30	Peer-review process and academic writing - Selection of journal and types of manuscript - Organizatin of research paper - Peer-review and editorial process - Common reasons of rejection - Common mistakes and tips for scientific writing	Saito, O. & Gondor, D.
Lecture 15	06/30 (Thu), 16:00-17:30	Final exam	Saito

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): *Scientific 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.