

Syllabus Module Major 224	
Module 224	Analysis in EPIDEMIOLOGY (II)
UE coordinator	Mary Beth TERRY Associate Professor of Epidemiology Mailman School of Public Health, Columbia University New York, NY, USA aah2138@columbia.edu
Dates	4th to 8th January 2016
Credits/ECTS	3 ECTS
Duration	5 days of 6 hours = 30 hours
UE description	<p>The course focuses on integrating study design methods with advanced statistical analyses. The lectures focus on methodological issues of study designs covering causal modeling and hypothesis development, variable construct and measurement issues, tabular and multivariable analyses. The purpose of this course is to provide both theoretical and practical experience in analyzing epidemiological data.</p> <p>The main textbooks used are Rothman's Modern Epidemiology and Hosmer and Lemeshow's Logistic and Survival Models. Lectures cover theoretical concepts from confounding, interaction, pseudo risks and rates, and generalized linear models. Computer laboratories use multiple data sets covering topics in linear, logistic (binary and polytomous), Cox Proportional Hazard, Poisson, and Quantile regression methods. Multivariable methods for testing for confounding, interaction, and mediation are taught both in lecture and laboratories.</p>
Prerequisites	Concepts Methods & design in Epidemiology
Course learning objectives	<p>Students who successfully complete this course will be able to:</p> <ol style="list-style-type: none"> 1. Integrate study design methods and advanced statistical analysis 2. Apply multivariable analyses 3. Clarify methodological issues for modeling and measurement 4. Critically appraise and interpret the findings of epidemiology papers
UE structure (details of sequence: title /speaker/date/duration)	<p>10 sessions: Introduction The Multivariable Model Absolute versus Relative Measures of Effect Observational Epidemiology and Counterfactuals <i>Lab 1: OR, IR and RR Relationship: Day 1: 3h</i> Measurement and Bias Overview of Precision versus Bias, Selection Bias, Information Bias Confounding <i>Lab 2: Reliability, Validity and Confounding: Day 1: 3h</i> Interaction Statistical Interaction Biological Interaction, Public Health Interaction <i>Lab 3: Interaction Day 2: 3h</i> Case-control Analysis I Design, Categorical Analyses, Logistic Regression Modeling <i>Lab 4: Logistic Regression, Day 2: 3h</i> Case-control Analysis II Model building Interaction in case-control studies Polytomous modeling, <i>Lab 5: Logistic Regression, Day 3 3h</i> Polytomous modeling <i>Lab 6: Polytomous Regression Day 3 3h</i> Cohort/Follow-up Analysis I Description, Tabular analysis, Basic survival analysis <i>Lab 7: Kaplan Meier Survival Analysis, Day 4 3h</i> Cohort/Follow-up Analysis II Non-parametric versus Parametric Approaches, PH Cox Models</p>

	<p>Poisson Models, <i>Lab 8: Cox PH Modeling, Day 4 3h</i> Advanced topics Conceptual, Tabular Analyses, Regression Models <i>Lab 9: Matched Analyses Modeling:</i> : Day 5: 3h</p>
Course requirement	
Grading and assesment	<p>Homeworks You will be asked to perform certain steps of analysis (and interpret the outputs) on topics that were covered in the lecture session using the dataset(s) provided.</p> <p>Computer Assignments</p> <p>Laboratories are designed to provide more informal discussions of conceptual issues, and to provide technical assistance to students.</p> <p>Homework assignment: 40% Final exam: Grade 60%</p>
Location	EHESP Campus in Paris
Readings	<p>The required text for this course is:</p> <p>Rothman K, Greenland S, Lash T. (2008) <i>Modern Epidemiology</i> (3rd edition). Philadelphia: Lippincott-Raven. Referred to as R&G.</p> <p>For theoretical aspects of epidemiological research and data analytic methods the following books are also recommended for reading and have been placed on reserve at the Health Sciences library:</p> <ol style="list-style-type: none"> 1. Hosmer DW (2004), Lemeshow S. <i>Applied Logistic Regression</i> (2nd edition). New York: John Wiley & Sons. 2. Hosmer DW (2008), Lemeshow S. <i>Applied Survival Analysis</i>. New York: John Wiley & Sons.