



University of Modena and Reggio Emilia

Department of Biomedical, Metabolic and Neural Sciences

PhD modul: Clinical and Experimental Medicine – CEM – Medicina Clinica e Sperimentale

Course: Statistical design of experiments

Academic year 2018 - 2019

Period: May 21st – June 10th 2019

Lecture time: 15.00 – 19.00 hours

Course location:

May 21st, 28th and 29th: **aula CS 1.4 Centro Servizi** - Largo del Pozzo, 71, Modena MO

June 3rd, 4th and 10th: **aula H 1.1 Istituti Biologici** - Via Giuseppe Campi, 287, Modena MO

Examination: Group assignment - presentation of the research protocol for predefined experimental study

Director of the course: Prof. Giuseppe Biagini

Course coordinator: Olivera Djuric, MD MSc

If you have specific questions about the contents of the course, please contact the course coordinator:

Olivera Djuric, MD MSc

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Course Programme

Date	Topic	Hours
Tuesday 21/5/2019	Part I Lecture: Principles of causation: causal inference, directed acyclic graphs, relation between variables (bias, confounding, effect modification)	1h
	Part II Lecture: Overview of epidemiological study designs Group assignment - problem solving	45min 30min
	Part III Lecture: Basics of experimental studies Theoretical exercise on types of experiential studies and types of clinical trials	1h 15min 30min
Tuesday 28/5/2019	Part I Lecture: Principles of statistical inference Group assignment - statistical vs. clinical inference	1h 15min
	Part II Lecture: Sample size and Power calculation Practical exercise on calculating power and sample size for experimental study	30min 15min
	Part III Lecture: Choice of adequate statistical test Group assignment - problem solving	45min 30min
	Part IV Practical exercise in SPSS or STATA	45min
Wednesday 29/5/2019	Part I Lecture: Basics of correlation – use and missuse Theoretical exercise – correlation	40min 20min
	Part II Lecture: Regression – basic principles Lecture: Linear regression and multiple linear regression	45min 1h 30min
	Part III Practical exercise in SPSS or STATA	45min
Monday 3/6/2019	Part I Lecture: Logistic regression – basic concepts	30min

	Lecture: Single and multiple logistic regression	45min
	Part II	
	Lecture: Logistic regression – variable selection and model building	45min
	Lecture: Logistic regression – statistical adjustment – interaction and confounding	45min
	Lecture: Logistic regression – diagnostics	30min
	Part III	
	Practical exercise in SPSS or STATA	45min
Tuesday 4/6/2019	Part I	
	Lecture: Statistical analysis in experimental design - intention to treat analysis, primary and subgroup analysis	45min
	Part II	
	Lecture: analysis of variance (ANOVA) and covariance (ANCOVA)	45min
	Lecture: repeated measures analysis	45min
	Lecture: time to event analysis – comparing survival curves	1h
	Part III	
	Practical exercises in SPSS or STATA	45min
Monday 10/6/2019	Presentation and discussion of a protocol for the experimental study assigned in day one	2h + 2h