

Learning Objectives per module

Part A: Introduction to statistical software

WEEK 1

- **A1 Introduction to statistics using R, Stata & SPSS** (*prerequisites: no prior knowledge of statistics required*)
- **A2 Power & sample size calculations** (*prerequisites: module A1 quiz*)

Module	Lecture Title	Lecture Content	Online Practical Tutorial Title
A1	LA1.1 Introduction to statistical software	<ul style="list-style-type: none"> • Welcome to R, SPSS or Stata 	PA1.1 Introduction to statistics
A1	LA1.2 Introduction to statistics	<ul style="list-style-type: none"> • Data types and distributions • Descriptive statistics (central tendency, SD, histograms, box plots) • Normal distributions 	PA1.1 Introduction to statistics
A1	LA1.3 Statistical inference	<ul style="list-style-type: none"> • Concept of estimation • SE, confidence intervals 	PA1.1 Introduction to statistics
A1	LA1.4 Hypothesis testing I	<ul style="list-style-type: none"> • Hypothesis tests involving means and difference in means (z-test, t-tests) • Interpreting hypothesis tests & p-values • Practical versus statistical significance 	PA1.1 Introduction to statistics
A2	LA2.1 Power & sample size calculations	<ul style="list-style-type: none"> • The concept of power • Calculations of power and sample size for different study designs 	PA2.1 Power & sample size calculations

Part B: Analysis of continuous outcomes

WEEK 2

- **B1 Linear regression** (*prerequisites: module A1 quiz*)

Module	Lecture Title	Lecture Content	Practical Tutorial Title
B1	LB1.1 Simple linear regression	<ul style="list-style-type: none"> • Linear correlation • Simple linear regression • One-way ANOVA and overall F-tests 	PB1. Linear regression

B1	LB1.2 Multivariable linear regression	<ul style="list-style-type: none"> • Multiple linear regression • F-tests for testing coefficients and comparing models • Regression diagnostics 	PB1. Linear regression
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WEEK 3

- **B2 Hypothesis testing II** (*prerequisites: module A1 quiz*)
- **B3 Non-parametric measures** (*prerequisites: module A1 quiz*)

Module	Lecture Title	Lecture Content	Practical Tutorial Title
B2	LB2.1 Hypothesis testing II	<ul style="list-style-type: none"> • ANCOVA • MANOVA • MANCOVA • Corrections for multiple comparisons 	PB2. Hypothesis testing II
B2	LB2.2 Repeated measures	<ul style="list-style-type: none"> • How to conduct analyses for paired data • Paired t-tests • Repeated measures ANOVA 	PB2. Hypothesis testing II
B3	LB3.1 Non-parametric measures	<ul style="list-style-type: none"> • When to use non-parametric methods • Mann-Witney U, Wilcoxon signed rank, Kruskal-Wallis, Friedman test, Spearman's rank order correlation • Non-parametric tests for repeated measures • Displaying results from non-parametric tests 	PB3. Non-parametric measures

Part C: Analysis of binary and survival data

Week 4

- **C1 Binary data and logistics regression** (*prerequisites: module A1, B1 quizzes*)
- **C2 Survival data** (*prerequisites: module A1, B1, C1 quizzes*)

Module	Lecture Title	Lecture Content	Practical Tutorial Title
C1	LC1.1 Prevalence, risk, odds & rates	<ul style="list-style-type: none"> • Binomial & Poisson distributions • Calculation of prevalence, risk, odds, rate • Calculation and interpretation of CI for risks, ratios and rates • Chi-square test; Fisher exact test • Cochran-Armitage test for linear trend 	PC1. Logistic regression
C1	LC1.2 Logistic regression	<ul style="list-style-type: none"> • Logistic regression for binary, continuous or categorical exposures • Multiple logistic regression 	PC1. Logistic regression

C2	LC2.1 Introduction to survival data	<ul style="list-style-type: none"> • Characteristics of survival and time-to-event data • Kaplan-Meier method and the log-rank test 	PC2. Survival data
C2	LC2.2 Regression for rates & survival data	<ul style="list-style-type: none"> • Poisson regression • Cox proportional hazards regression 	PC2. Survival data