BIOSTATISTICS COURSE

INTRODUCTION

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Program

DESCRIPTIVE STATISTICS FOR BIOLOGICAL VARIATION: Statistical unit, target population, sample, variables and data. Types of variables. Summary indicators (central tendency and dispersion).
DATA COLLECTION AND PRESENTATION OF DATA: Methods for collecting and coding data; quality control; Data-bases for statistical analysis; Presentation of data in graphs and tables.
RANDOM VARIABLES AND PROBABILITY DISTRIBUTIONS: definitions of probability; conditional probability and independence; probability distributions and random variables (examples of Gaussian and Binomial distribution).
DIAGNOSTIC PROCESS EVALUATION: sensitivity, specificity; clinical decision: probability as uncertainty measure; predictive value of a test.
EVALUATION OF RESULTS IN A CLINICAL STUDY: population parameter, sample estimate and standard error; confidence intervals; statistical hypothesis test, significant level and power; application of a statistical test, p-value; sample size calculation; statistical inference; basic concepts of regression and correlation; different types of studies in clinical and epidemiological research, observational and experimental studies; efficacy measures (relative risk, odds ratio).

Lessons will take place in Bergamo (A-11, via Nini Da Fano 11)

Group works will be organized (evaluated – an extra point on the final exam grade will be granted to the best performing ones)

Quiz/questions pre/post lesson (not evaluated)

Tuesday available for questions etc on appointment

Applied Biostatistics

- Lectures will be always followed by exercise (on paper)

  Always bring a calculator!

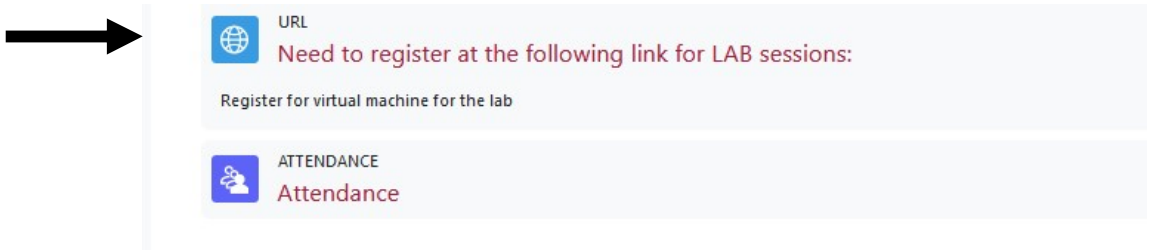
- We will also see a software to perform statistical analysis and visualization of data: **STATA**

- We will discuss extracts of clinical papers

Applied Biostatistics
generally on Monday 9 am in Bergamo if you can bring your own PC, otherwise Monza LAB could be used.

Use of the statistical software STATA by the virtual machine:

Need to register at the following link:
https://libaas.unimib.it/PubLab/register/e16aa4cb85df06ef4a6f

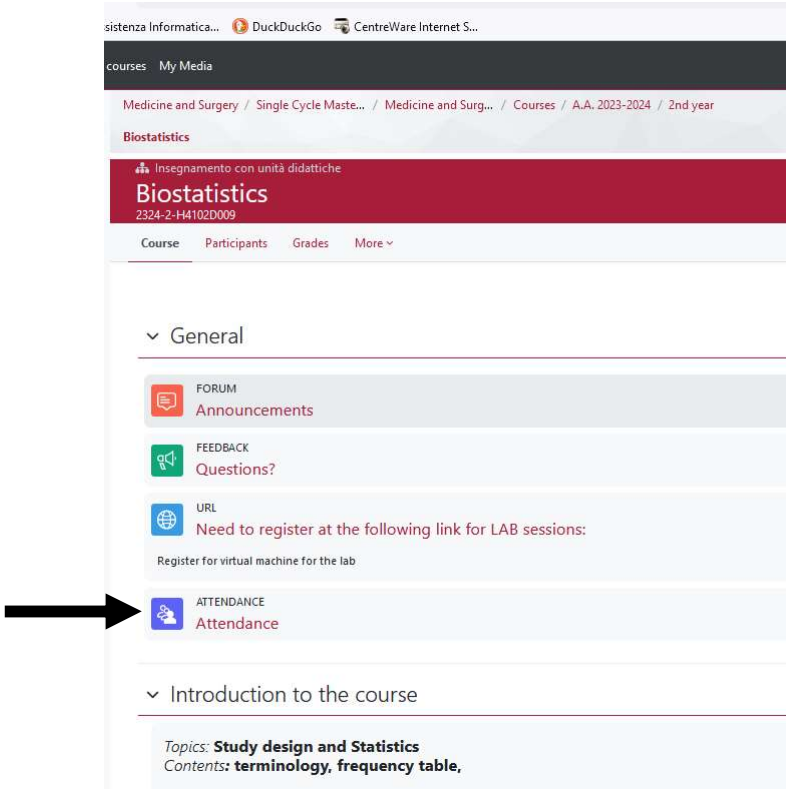


Material on:

http://elearning.unimib.it/

Login&password unimib (campus e-mail)

Register your attendance at the course webpage:



Scan the QR code below or use the password listed below to take your attendance

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Textbooks:

SCHOOL OF MEDICINE AND SURGERY

- *J. Martin Bland.* An Introduction to Medical Statistics, Oxford 2015

  available at the library of Monza & as **E-book**

- *Marc M. Triola, Mario F. Triola, Jason Roy.* Biostatistics for the Biological and Health Sciences, 2nd Edition Pearson 2018

  available at the library of Monza & as **E-book**

- For Application of Biostatistics: https://www.stata.com/

The software used is available as academic license

Other possible textbooks:

- *J. Martin Bland and Janet Peacock.* Statistical Questions in Evidence-based Medicine, Oxford 2000

  available at the library of Monza

- *Stanton A. Glantz.* Primer of Biostatistics, McGraw-Hill Education / Medical 2011

  available at the library of Monza

Exam

- 6 exam appeals:

  3 at the end of first semester

  1 june; 1 july; 1 september

- Final written test on *esami.online* platform (computer LAB) including:

  -3/4 exercises to test the ability of the student in the application of statistics

  -4/5 questions with closed answer to evaluate the preparation on the overall program

  -1 test on an extract of a clinical paper to evaluate the interpretation of basic statistics in medical literature.

Final exercise session at the last lecture

"Team-based learning" & lab project

TEAM-BASED LEARNING

- Read the material I provide you
- Individual Readiness Assurance Test, **I-RAT**
- Team-Readiness Assurance Test, **T-RAT**

- Assessment based on both individual test and team test
- Ranking at the end of the course based on 3 TBL that will provide an extra point at the final grade of the exam for the best performaces