Statistics

2023 Lectures
Part 1 - Introduction

Institute of Economic Studies
Faculty of Social Sciences
Charles University in Prague

Outline

(i) Summary of Introductory Statistics
(ii) Syllabus of Statistics
(iii) Requirements

Summary of Introductory Statistics

- data set, sample statistics
- summary and visualization of data
- sample space, events
- definitions of probability
- counting techniques
- conditional probability, Bayes theorem, independence of events
- sampling techniques

Syllabus

Week 1 2.10.2023; 3.10.2023
Introduction
Random Variables

Week 2 9.10.2023; 10.10.2023
Random Variables

Week 3 16.10.2023; 17.10.2023
Multivariate Distributions

Week 4 23.10.2023; 24.10.2023
Expectation

Week 5 30.10.2023; 31.10.2023
Expectation

Syllabus

Week 6 6.11.2023; 7.11.2023
Conditional Distributions and Expectation
Selected Families of Distribution

Week 7 13.11.2023; 14.11.2023
Selected Families of Distribution

Week 8 20.11.2023; 21.11.2023
Random Samples

Week 9 27.11.2023; 28.11.2023
Random Samples
Point Estimation
Midterm 28.11.2023

Syllabus

Week 10 4.12.2023; 4.12.2023
Point Estimation
Interval Estimation

Week 11 11.12.2023; 12.12.2023
Testing statistical hypotheses

Week 12 18.12.2023; 19.12.2023
Testing statistical hypotheses
History of Statistics (optional)
Introduction to Econometrics (optional)

Requirements

- Midterm test – 15 points – November 28
- Homeworks – 20 points – Five assignments:
  - W03 4 points, W05 4 points, W07 4 points, W10 4 points, W12 4 points
- Exam test – 50 points; at least 25.5 points or more, else F
  - minimum requirement of more than 50% from the exam test
- Oral exam – 15 points; at least 8 points or more, else F
  - minimum requirement of more than 50% from a discussion
- Book reading + Active work

A 91% – 100%
B 81% – 90%
C 71% – 80%
D 61% – 70%
E 51% – 60%
F 0% – 50%

Bonus points are illegal. Non-integer values are rounded up.

Time Requirements

- The credit load of 7 ECTS corresponding to 210 hours or students' work:
  - participation lecture time including online videos – 36 hours
  - participation seminar time – 16 hours
  - time anticipated for work on homeassignments – 5x10 hours
  - time anticipated for midterm preparation – 15 hours
  - time anticipated for exam preparation – 60 hours
  - exam – 3 hours
  - time anticipated for additional home study and reading during the semester – 30 hours

Exam Dates

- No exam dates in 2023!
- Exam dates for 2024 will be announced during the semester, no later than on December 10, 2023.

Literature

Mandatory book reading and main source of problems for seminar class and home assignments:

- BARTOSZYNSKI, R. and NIEWIADOMSKA-BUGAJ, M. Probability and Statistical Inference. 3rd ed, Wiley, 2021 (Sections 5.1 – 12.9)
- RAMACHANDRAN, K.M., TSOKOS, C.P. Mathematical Statistics with Applications in R, 3rd ed, Elsevier, 2020 (Sections 2.5 – 6.6)

Further recommended but only voluntary:

- ANDERSON D.R. at al. Statistics for Business and Economics. 15th ed, Cengage Learning, 2023
- MITTELHAMMER, R.C. Mathematical Statistics for Economics and Business. 2nd ed, Springer, 2013
- SUHOV, Y., KELBERT, M. Probability and Statistics by Example, volume 1, 2nd ed Cambridge Uni Press, 2014.