The Hebrew University of Jerusalem

Syllabus

STATISTICS - 54111

Last update 24-07-2016

HU Credits: 4

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: prog.in philosophy, economics &political science

Academic year: 2017

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: Mt. Scopus

Course/Module Coordinator: Dr. Michael Byalsky

Coordinator Email: msbyalsk@mscc.huji.ac.il

Coordinator Office Hours: Thurs, 10:15-11:15, room 4213

Teaching Staff:

Dr. Michael Byalsky
Mr. Ori Ziv

Course/Module description:
The course deals with the following subjects: descriptive statistics, probability theory and statistical inference, emphasizing the theoretical foundation and a variety of applications.

Course/Module aims:
The aim of the course is to provide to the students the basic skills and tools of statistics and probability theory.

Learning outcomes - On successful completion of this module, students should be able to:
To deal with statistical analyzes in practical work and research in the social sciences and humanities. To master tools for statistical models' application in graduate studies and independent research.

Attendance requirements(%):
80%

Teaching arrangement and method of instruction: Frontal lectures on the theoretical and practical themes accompanied by miscellaneous demos. Frontal practice devoted to the examples solving, the studied methods applying, development of techniques, use of the necessary tools.

Course/Module Content:
1. Basic concepts. Descriptive statistics and inferential statistics. Population and sample. Data organization. Random variables and their types.
2. Data presentation using tables and graphic descriptions. Data processing, frequency. The center measures (indices): mode, median, average. Measures (indices) of dispersion: range, interquartile range, variance, standard deviation.
3. Sets and combinatorics. The set concept. Venn diagrams. Relations and operations on sets. Ordered and non-ordered samples. Basic formulas of combinatorics.
4. Statistics and probability. Random experiment as a source of random events. Events algebra. Universal set of events. Disjoint and overlapping events .
5. Concept of probability. Probability theory as mathematical model for random phenomena. Definitions of probability and the probability space.
6. Calculating of probabilities using combinatorics . Probability axioms and basic

theorems .
7. Conditional probability. Chain rule. Multiplication and Bayes formulas. Law of total probability. Independence. Dependent and independent events.
8. Random variables. Discrete variable. One- and two-dimensional random variable. Different special one-dimensional distributions. Moments of a random variable. Expectation, variance and their properties.
9. Distribution table, calculating of expectation and variance. Correlation between variables, covariance. Pearson's correlation coefficient. Joint Distribution. Independence of random variables.
10. Continuous random variable and probability for it. Density function. Probability distribution function. Specific distributions, normal distribution.
11. Relation between the population and samples. Law of large numbers . The normal approximation to the binomial distribution.
12. Linear regression. Principle of least squares. Forecasting using regression line. The statistical estimation . Confidence interval. Hypothesis testing. Special tests.

Required Reading:
רביב אלונה, תלמה לויתן, מבוא להסתברות וסטטיסטיקה. כרכים "הסתברות", "הסקה סטטיסטית", תל-אביב, עמיחי, 2005.

Additional Reading Material:
איזנבך רונית, סטטיסטיקה ל"לא סטטיסטיקאים", אקדמון, האונ' העברית, ירושלים, תשנ"ב.
שמואלי עמיר, מושגי יסוד באקונומטריקה, כרך א', מהד' ב' (עדכון: משה קים, נסים בן-דור), האוניברסיטה הפתוחה, ת"א, תשס"ג-2002.
מבוא לסטטיסטיקה ולהסתברות,יחידות 1-10, מהד' שנייה, האוניברסיטה הפתוחה, ת"א, תשנ"ד-1994.
Anderson D.R., Sweeney D.J., Williams T.A., Statistics for Business and Economics with Student Test Review CD-ROM, 9th ed. Thomson Learning, 2005.
Kohler H., Statistics for Business and Economics with Excel CD-ROM, Thomson Learning, 2002.

Course/Module evaluation:
End of year written/oral examination 100 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information:

The exercise submission must is at least 80% of the home tasks. The exercises should be fulfilled singly (joint submission is not allowed). A student which returned to the course and fulfilled his submission in the previous year, should submit a home task depending on the teacher decision. Exercise exemption will be given only because of a reserve duty and hospitalization.