



The Hebrew University of Jerusalem

Syllabus

REGRESSION AND LINEAR MODELS (CS) - 52307

Last update 14-10-2018

HU Credits: 4

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Statistics

Academic year: 0

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Or Zuk

Coordinator Email: or.zuk@mail.huji.ac.il

Coordinator Office Hours: Sunday 12:00

Teaching Staff:

Dr. Or Zuk
Mr. haimi vieder

Course/Module description:
Linear regression.

Course/Module aims:
To learn the theoretical basis of linear regression, as well as how to apply it in analyzing data sets.

Learning outcomes - On successful completion of this module, students should be able to:

Define a linear regression model.
Compute the corresponding estimates and test statistics.
Construct a model appropriate for a given problem and set of data.
Apply the estimates and test statistics to analyze the data.
Perform the calculations using a computer.
Understand the geometrical interpretation of regression.

Attendance requirements(%):
0

Teaching arrangement and method of instruction: The instructor will teach the theory and write on the board. In addition, he will display many examples with computer output (data sets, results of statistical analyses, etc.)

The tirlgul will emphasize analysis of datasets using the computer.

Exercises and examples will be uploaded to the course's website

Course/Module Content:

Simple linear regression: Examples, formulation and interpretation of the model, estimation using ordinary least squares.

Multiple linear regression: Examples, formulation and interpretation of the model - defining explanatory variables, transformations, interactions. Estmation using ordinary least squares and maximum likelihood, multiple correlation coefficient,

multicollinearity

The geometric interpretation of regression: subspaces, orthogonality, projections, Pythagorean Theorem. Distribution of the estimates and statistical inference. Verifying the appropriateness of the model - examining residuals, measures of influence, partial residuals, variance-stabilizing transformations.

Building models: Stepwise methods for choosing subsets of explanatory variables, multicollinearity, definitions of "good equations", the Cp statistic.

Models with dependent errors: Examples, formulation of a model, the likelihood function, estimation using weighted least-squares.

Required Reading:

None

Additional Reading Material:

Additional Reading Material:

Draper, N. and Smith, H. (1998). Applied Regression Analysis.

Daniel, C. and Wood, F. (1971). Fitting Equations to Data.

Weisberg, S. (1980). Applied Linear Regression.

Course/Module evaluation:

End of year written/oral examination 60 %

Presentation 0 %

Participation in Tutorials 0 %

Project work 40 %

Assignments 0 %

Reports 0 %

Research project 0 %

Quizzes 0 %

Other 0 %

Additional information:

There will be a project for submission at the end of the second third of the semester (40%).

Despite the above, the final exam grade will be 100% of the final grade in case of a failing grade in the exam