האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

LOGISTIC REGRESSION - 98448

Last update 06-03-2022

HU Credits: 2

Degree/Cycle: 2nd degree (Master)

Responsible Department: Public Health

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: Ein Karem

Course/Module Coordinator: Mr. Wiessam Abu Ahmad

Coordinator Email: wiessam.huji@gmail.com

Coordinator Office Hours:

Teaching Staff:

Mr. Wiessam Abuahmad,
Ms. Shahera Abu Ramila

Course/Module description:
Please see the Hebrew description

Course/Module aims:
The course will cover hypothesis testing at the Univariable analysis step and at the Multivariable analysis: the functional form of the Linear regression, General linear models (Univariate and Repeated measures) and the logistic regression model, including checking the model's assumptions and interpreting the model's coefficients and results. The course is accompanied by a series of examples using the statistical Rstudio and WinPepi statistical packages, where the emphasis is on practical application and interpretation rather than theory.

Learning outcomes - On successful completion of this module, students should be able to:
Exploring data: describe the data, compute new variables, assess the shape of the distribution, select a suitable tool for statistical analysis, conduct Univariable and Multivariable statistical analysis, multiple regression models and General linear models (GLM).

Attendance requirements(%):
75%

Teaching arrangement and method of instruction:

Course/Module Content:
1. Measures of Association in contingency tables: Pearson's chi-square test, G-test, Fisher's Exact test, Cochran's rule, Odds ratio, Relative risk and Yates', Walds' and Williams' corrections.
2. Hypothesis testing for means: Normality assumption, independent samples t-test, paired t-test, non-parametric alternative tests: Wilcoxon Signed- Rank Test and Mann-Whitney U-Test.
3. Correlation and Regression: Scatter Diagram, Pearson's coefficient of correlation, linear regression models: principal of least square, regression lines, regression coefficient, properties of regression coefficients, F-test for model significance, t-test for coefficients significance, total variance decomposition (amount of variance explained), Multicollinearity, dealing with nominal variables and comparing between models.

4. Analysis of variance (ANOVA) and analysis of covariance (ANCOVA): Theoretical background, testing hypothesis, graphing interactions, multiple comparisons for main effects and for interaction effect, comparison with linear regression models, Repeated Measures ANOVA, non-parametric alternative: Kruskal-Wallis and Friedman tests.
5. Logistic regression: Principal of likelihood ratio, theoretical background, chi-square test for model significance, Z-test for coefficients significance, goodness of fit.
6. Other regression models: Ordered logistic, Multinomial, Poisson and Negative binomial.

Required Reading:

1. Rao, P.V. (1998).Statistical research methods in the life sciences. Duxbury Press.

2. Zar, J. (2007). Biostatisticalanalysis (5th ed.). Prentice-Hall, Inc.
3. Gordis, L. (2008). Epidemiology (4th Ed.) Saunders: Philadelphia.
4. Vogt, W. P., Vogt, E. R., Gardner, D. C., &Haeffele, L. M. (2014). Selecting the right analyses for your data: quantitative, qualitative, and mixed methods. The Guilford Press.

Additional Reading Material:

Course/Module evaluation:
End of year written/oral examination 70 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 30 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information: