COURSE DETAIL

LINEAR AND LOGISTIC REGRESSION

Country
Sweden

Host Institution
Lund University

Program(s)
Lund University

UCEAP Course Level
Upper Division

UCEAP Subject Area(s)
Statistics Mathematics Engineering

UCEAP Course Number
131

UCEAP Course Suffix

UCEAP Official Title
LINEAR AND LOGISTIC REGRESSION

UCEAP Transcript Title
LINEAR LOGISTIC RGR

UCEAP Quarter Units
6.00

UCEAP Semester Units
4.00

Course Description

This is an advanced course in linear and logistic regression, which expounds on the knowledge gained in introductory mathematical statistics courses. It covers matrix formulation of multivariate regression, methods for model validation, residuals, outliers, influential observations, construction and use of F- and t- tests, likelihood-ratio-test, confidence intervals and prediction, and applied implementation of various techniques in R software. Students also consider correlated errors, Poisson regression, multinominal and ordinal logistic regression. The first part of the course expands on previous study of linear regression to consider how to check if the model fits the data, what to do if it does not fit, how uncertain it is, and how to use it to draw conclusions about reality. The second part of the course explores logistic regression, which is used in surveys where the answers follow a categorical alternative pattern such as "yes/no," "little/just fine/much," or "car/bicycle/bus." Students describe differences between continuous and discrete data, and the resulting consequences for the choice of statistical model. Students learn to give an account of the principles behind different estimation principles, and describe the statistical properties of such estimates as they appear in regression analysis. The interpretation of regression relations in terms of conditional distributions is studied. Odds and odds ration are presented, and students describe their relation to probabilities and to logistic regression. Students formulate both linear and logistic regression models for concrete problems, estimate and interpret the parameters, examine the validity of the model and make suitable modifications, use the model for prediction, utilize a statistical computer program for analysis, and present the analysis and conclusions of a practical problem in a written report and oral presentation. The course makes use of lectures, exercises, computer exercises, and project work.

Language(s) of Instruction
English

Host Institution Course Number
FMSN30/MASM22

Host Institution Course Title
LINEAR AND LOGISTIC REGRESSION

Host Institution Campus

Host Institution Faculty
Science and Engineering

Host Institution Degree

Host Institution Department
Mathematics

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