



ניתוח הישרדות 0356.4032 פרופ' מלכה גורפיין

Time and Place

Wednesday, 12:00 – 15:00, Dan David, 204
שעת קבלה: יום ד, 9:00 – 10:00 (כדאי לתאם מראש)

Course Description

In this course we consider methods for the analysis of data when the response of interest is the time until some event occurs. In the classical survival analysis a collection of individuals are observed from some entry time until a particular event (generally referred as failure) happens. Often it is impossible to wait for the event to happen for all individuals, so for some it is only known that the event had not yet happened at some specified time. The problem of analyzing time to event data arises in a number of applied fields such as: biology, public health, epidemiology, engineering, economics and demography. A principle problem examined is that of developing methods for assessing the dependence of failure time on explanatory variables. The course covers the basic concepts and theory of modeling such data.

Course Outline

1. Basic quantities and models: survival functions, hazard function, mean residual life function, common parametric models, and regression models.
2. Censoring and truncation: right censoring, left censoring, interval censoring, truncation, likelihood for censored and truncated data.
3. Non-parametric estimation of basic quantities, and maximum likelihood estimation of parametric models.
4. Hypothesis testing: one-sample, two or more samples and stratified tests among others.
5. Counting processes and martingales.
6. Semi-parametric proportional hazards and accelerated failure time regression models and their extensions: fixed covariates, time-dependent covariates, stratified PH models, model diagnostics.
7. Competing risks (if time permits).

Prerequisites:

Introduction to probability, Theory of Statistics



Final grade:

10% homework exercises

90% final project

Textbooks:

1. Kalbfleisch, J.D. and Prentice, R.L. *The Statistical Analysis of Failure Time Data*. 2nd Edition. John Wiley & Sons. 2002.
2. Therneau, T.M. and Grambsch, P.M. *Modeling Survival Data: Extending the Cox Model*. Springer. 2000.
3. Klein, J.P. and Moeschberger, M.L. *Survival Analysis: Techniques for Censoring and Truncated Data*. 2nd Edition. Springer. 2003.