



STATISTICS 433 "SURVIVAL MODELS"

Calendar Description: H(3-1T)

Nature and properties of survival models; methods of estimating tabular models from both complete and incomplete data samples including actuarial, moment and maximum likelihood techniques; estimations of life tables from general population data.

Prerequisite: Mathematics 323, 353, and Actuarial Science 327.

Suggested Text: Survival Analysis, by Klein and Moeschberger, Springer 1997; Estimation, Evaluation and Selection of Actuarial Models, by Klugman (Chpts 2 and 5); Survival Models and their Estimation, by Dick London, second edition.

Syllabus

Topics

Number of hours

The survival function. The hazard function. The mean residual life time function and median life. Common parametric models for survival data.	3
Right censoring. Left or interval censoring. Truncation. Likelihood construction for censored and truncated data.	3
Estimators of the survival and cumulative hazard functions.	3
Pointwise confidence intervals for the survival function. Confidence bands for the survival function. Point and interval estimates of the mean and median survival time.	3
Estimators of the survival function for left-truncated and right-censored data.	2
Estimating the survival function for left, double and interval censoring. Estimation of the survival function for right-truncated data.	3
Estimation of survival in the cohort life table.	2
Estimating the hazard function. Estimation of excess mortality.	3
One-sample tests. Tests for two or more samples. Test for trend.	3
Stratified tests. Renyi type tests. Other two-sample tests.	3
Partial likelihoods for distinct-event time data.	3
Partial likelihood when ties are present. Local tests.	2
Model building using the proportional hazards model. Estimation of the survival function.	3

TOTAL:

36

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