UNIVERSITY OF CALGARY

FACULTY OF SCIENCE
Department of Mathematics and Statistics

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, 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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