Addinsoft
40 rue Damrémont
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ADDINSOFT | DATA SCIENCE MADE SIMPLE

SURVIVAL ANALYSIS | ALL METHODS
(NON-PARAMETRIC, SEMI-PARAMETRIC AND PARAMETRIC)

This course is intended for people who want to perform survival analysis. It is a complete presentation that allows participants to understand the usage context and approach to follow for all of these techniques. They will have the keys to perform and interpret life cycle analyses, from the presentation of censored data to the different modeling methods:

- Non-parametric (Kaplan-Meyer and actuarial)
- Semi-parametric (Cox models)
- Parametric (Weibull and exponential laws)

Duration: 4 days (28 hours)
Location: The course is available in-person at your premises or online via videoconference
Price (excluding VAT) :

- Inter-company online training : n/a
- Intra-company online training : $7600,00 per training
- Intra-company on site training : $7600,00 per training + trainer's travel expenses

Trainee profiles :

- Reliability engineers
- Researchers
- Students (biology and epidemiology)
- Actuaries

Required experience :
Participants must have a good knowledge of basic statistical tools: descriptive statistics, hypothesis testing, confidence intervals, p-value, alpha risk, etc.

Training objectives

- Understand the central concepts of survival/lifetime analysis
- Know the vocabulary associated with this type of analysis
- Identify the situations where survival/lifetime analysis tools are used
- Understand the instantaneous hazard, cumulative hazard, survival and cumulative survival functions
- Carry out non-parametric analyses of survival data
- Create graphical representations (survival curve, cumulative survival, KM or actuarial method)
- Understand semi-parametric modeling and perform diagnosis
- Understand the use cases for parametric modeling.
- Understand the distribution of time
- Understand parametric modeling

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Training syllabus

- **Introduction to Survival Data Vocabulary**
  - Dates and durations of follow-up (entry date, point date, last date, setback, status, etc.)
  - Censorship concepts (right, left, interval, non-informative, random)
  - Survival estimation: survival function, instantaneous hazard function, cumulative hazard function

- **Survival Estimation**
  - Nonparametric estimation of survival: Kaplan-Meyer estimator
  - Non-parametric estimator of cumulative hazard: Nelson - Aalen estimator
  - Actuarial estimation: time scale set by the user
  - Comparison of survival by groups: Log-Rank test
  - The concept of relative risk
  - Graphical representation of survival and cumulative risk curves: Representation, Interpretation

- **Semi-parametric modeling**
  - The Cox model: context of use of this type of model
  - Hypothesis of proportional hazards
  - Managing simultaneous events
  - Effects of variables
  - Diagnostic measures on co-variables
  - Suitability of the model
  - Diagnostic measures for the assumption on proportional hazards
  - Coding the co-variables
  - Time-dependent variables
  - Stratification

- **Parametric modeling**
  - A priori distribution of lifetimes
  - Accelerated models
  - Exponential model
  - The Weibull model
  - Other models and usage conditions
  - Model estimation: maximum likelihood
  - Hypothesis testing and modeling quality
  - Left and time-dependent censors
  - Predictions
  - Interpretation of software outputs

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Training organization

Arkesys teaching team:
- **Thierry Anthouard** is the head of the Arkesys Group's statistical training program and has always been passionate about the field of statistics. In 1992, he launched the development of the Arkesys Group's statistics training program. His "by example" pedagogical approach allows him to popularize statistics and to make it accessible to all learners. As a consultant supporting key accounts, he adapts to all types of contexts and learning issues.
- **Jérôme-Philippe Garsi** is a statistical instructor with 13 years of experience in the training field. Since his doctorate on clinical issues, his work is mainly focused on the interest of populations, their health and well-being. At ease with any audience, he makes pedagogy and the simplification of scientific knowledge a priority. To do so, he always takes the greatest care to be clear in his written documents as well as in his oral presentations.

Teaching techniques:
- Theoretical explanations followed by guided practice and autonomous learning
- Additional support documents are posted online after the course
- Supplemental exercises can be loaded onto a USB key

Follow-up: evaluating training participation and results
- Attendance sheets
- Review and evaluation exercises
- Evaluation at the end of the course
- Certificate of completion of the course

Accessibility for disabled people:
People with disabilities who wish to take this course can contact us directly so we can examine together the best way to proceed.

Amount of time the course materials will be available before it starts: 2 weeks

Online training: The link to the virtual classroom will be sent by email the week before the course starts.

Contact: For further information you can contact us by email at: training@xlstat.com or by phone at (646) 412 3348.

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