

## **Invitation to a Course on Advanced Statistical Methods in Insurance**

28<sup>th</sup> September 2011 to 1<sup>st</sup> October 2011  
Salzburg University

- Lecturers:** Prof. Dr. Marcus Hudec  
Department of Scientific Computing, Vienna University  
Director of Data Technology, Vienna  
Visiting professor at Salzburg University
- Dr. Michael Schlögl  
Head of Motor Insurance Department  
Member of the Extended Management Board  
Wiener Städtische Versicherung AG – Vienna Insurance Group, Vienna  
Visiting professor at Salzburg University
- Dates:** Wednesday, 28<sup>th</sup> September, 9.00 – 17.30  
Thursday, 29<sup>th</sup> September, 9.00 – 17.30  
Friday, 30<sup>th</sup> September, 9.00 – 17.30  
Saturday, 1<sup>st</sup> October, 9.00 – 12.30
- Contents:** The course covers all aspects of advanced statistical methods in insurance required to become a fully qualified actuary according to the education syllabus of the International Actuarial Association and the core syllabus of Groupe Consultatif as well as according to the regulations of the Actuarial Association of Austria (AVÖ), which correspond to the regulations of the German Actuarial Association (DAV). For continuing professional development (CPD) the course counts as 21 hours. The methods and models will be illustrated by specific applications (premium calculation and reserving, optimizing cross-selling and up-selling campaigns in insurance marketing). The emphasis will be on a practical and data oriented approach. The course is suited to all those who want to acquire knowledge of advanced statistical methods in insurance. A basic stochastic knowledge is sufficient. Please find the structure of the course below.
- Course fees:** €498 without hotel accommodation, €858 with accommodation from Tuesday to Saturday (4 nights) in the Castellani Parkhotel including breakfast. Lunches and coffee breaks are included in the fees for all participants.
- Information:** For further information, please contact Sarah Lederer by e-mail ([sarah.lederer@sbg.ac.at](mailto:sarah.lederer@sbg.ac.at)) with your telephone number. Your questions will be answered as soon as possible.

Registration: Please send the attached registration form by post or by e-mail ([sarah.lederer@sbg.ac.at](mailto:sarah.lederer@sbg.ac.at)), or fax it to +43 662 8044 155, and arrange for the amount to be transferred (at no cost to the recipient) to the following account before 26<sup>th</sup> August 2011. After this date registration with hotel accommodation is only possible upon request. The registration and payment deadline for participants who do not need accommodation is 9<sup>th</sup> September 2011.

Salzburg Institute of Actuarial Studies (SIAS)  
IBAN: AT 792 040 400 000 012 021 BIC: SBGSAT2S

Location: Faculty of Science, Lecture Hall 402  
A-5020 Salzburg, Hellbrunner Straße 34

## Course Structure

### Part I: Advanced statistical methods for premium calculation and reserving

- 1 Modelling approaches**  
Insurance principle, methods in life, health and non-life insurance, smoothing of raw data, tariff structures
- 2 General linear model**  
Simple and multiple regression, regression with indicator variables, modelling of non-linearities, weighted least squares
- 3 Generalized linear model**  
Model structure, logistic regression, examples of application
- 4 Credibility models**  
Basics of credibility theory, Bayesian credibility, Bühlmann credibility model, Bühlmann-Straub credibility model
- 5 Simulation techniques**  
Monte Carlo method – concepts and ideas, generation of random variables, bootstrapping, stochastic reserves, examples of application
- 6 Multivariate data**  
Motivation and examples, visualization of multivariate data, principal component analysis, discriminant analysis

### Part II: Data mining concepts for the optimization of cross-selling and up-selling campaigns in insurance marketing

- 1 Data mining process**  
CRISP-DM, evaluation of models and overfitting
- 2 Prediction**  
Strategies of statistical modelling (selection of variables, model choice), ridge regression, regression trees
- 3 Supervised learning (classification)**  
Classification trees, naive Bayes classifier, regularized discriminant analysis, k-nearest neighbour, support vector machines, ensemble methods
- 4 Unsupervised learning (clustering)**  
Hierarchical methods, k-means, mixture models