Applied Statistical Regression – AS 2013

People:

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Course Schedule:

All lectures will be held at HG D1.1, on Mondays from 8.15-9.00, resp. 9.15-10.00.

Week	Date	L/E	Topics
01	**16.09.2013**	**---**	**---**
02	**23.09.2013**	**L/L**	**Linear Modeling & Smoothing**
03	**30.09.2013**	**E/E**	**Introduction to R**
04	**07.10.2013**	**L/L**	**Simple Linear Regression**
05	**14.10.2013**	**L/E**	**Curvilinear Models, Variable Transformations**
06	**21.10.2013**	**L/L**	**Multiple Linear Regression: Fitting and Inference**
07	**28.10.2013**	**L/E**	**Extensions: Categorical Variables, Interactions**
08	**04.11.2013**	**L/L**	**Model Diagnostics: Residual Plots**
09	**11.11.2013**	**L/E**	**Model Choice: Variable Selection**
10	**18.11.2013**	**L/L**	**Cross Validation, Modeling Strategies**
11	**25.11.2013**	**L/E**	**Logistic and Binomial Regression**
12	**02.12.2013**	**L/L**	**Regression for Nominal and Ordinal response**
13	**09.12.2013**	**L/E**	**Poisson Regression for Count Data**
14	**16.12.2013**	**L/L**	**Advanced Topics**

Exercise Schedule:

The exercises start on September 30, 2013 from 8.15 to 10.00 with an introduction to the statistical software package R. This takes place at the computer labs, the rooms will be communicated by the coordinators via e-mail. Then, the exercise schedule is as follows:

Series	Date	Topic	Hand-In	Discussion
01	30.09.2013	Data Analysis with R	---	30.09.2013
02	30.09.2013	Simple Regression	07.10.2013	14.10.2013
03	14.10.2013	Multiple Regression 1	21.10.2013	28.10.2013
04	28.10.2013	Multiple Regression 2	04.11.2013	11.11.2013
05	11.11.2013	Multiple Regression 3	18.11.2013	25.11.2013
06	25.11.2013	Logistic Regression	02.12.2013	09.12.2013
07	09.12.2013	Count and Ordinal Data	---	09.12.2013

All exercises except the R introduction take place at HG E41 (group of Kerkhoff) and HG D1.1 (group of Robert). All students whose last name starts with letters A-K visit the group of Nowzohour, whereas the ones with letters L-Z visit the Jimenez group.

The solved exercises should be handed in at the end of the lecture of the due date or placed in the corresponding tray in HG J68 until 12.00am. Please note that only final recapitulatory documents shall be handed in, but no R script files.

Software:

The exercises will be based on the statistical software package R. This is a freely available open source suite which works on all platforms, see (http://stat.ethz.ch/CRAN/). A good primer is the R tutorial that will be discussed in the exercises of September 30. Further documentation is available from CRAN.

Written Material

There is a scriptum for this course. The scriptum, as well as the slides that are presented during the lectures, the exercise sheets, the sample solutions and some instructional datasets are also available for download from the course website at http://stat.ethz.ch/education/semesters/as2013/semesters/as2013/asr.

Credit Points:

There are no longer conditions for obtaining the attendance certificate. This also holds for PhD students that are after ETH credit points for their doctorate. All doctoral students, as well as other attendants who are after ECTS credit points need to attend and pass the exam for getting the credits awarded

Exam

There will be a written exam during the regular session that lasts 120 minutes. It will be "open book", thus you are allowed to bring any written materials you wish. We also recommend bringing a pocket calculator. However, notebooks/computers are not allowed.

Literature:

1) **Linear Models with R**, Julian J. Faraway, Chapman & Hall/CRC (2005). ISBN-10: 1584884258. 229 pages, ca. 70$.

   There is a freely available version on CRAN, entitled **Practical Regression and Anova using R**: http://cran.r-project.org/doc/contrib/Faraway-PRA.pdf. This free version is not identical to the book, but it is still a very good reference. For the later chapters of the course, the second volume of Faraway's regression literature is required:

   Extending the Linear Model with R, Julian J. Faraway, Chapman & Hall/CRC (2006). ISBN-10: 158488424X. 312 pages, ca. 75$.

2) **Applied Regression Analysis**, N. Draper and H. Smith, Wiley Interscience, 3rd Edition (1998). ISBN-10: 0471170828. 736 pages, ca. 100$.

3) **Introduction to Linear Regression Analysis**, D. Montgomery, E. Peck, G. Vining, Wiley-Interscience, 4th Edition (2006). ISBN-10: 0471754951. 640 pages, ca. 85$.

4) **Applied Regression Analysis and Generalized Linear Models**, J. Fox, Sage Publications, 2nd Edition (2008). ISBN-10: 0761930426. 688 pages, ca. 82$.