

R - TECHNICAL SHORT COURSE

Date: 02.05.2017 - 09.30-13.00,
03.05.2017 - 14.00-17.30,
04.05.2017 - 09.30-13.00

Location: KIT Campus South, Building 20.40, GIK PC-Pool (Room 039)

Lecturer: Prof. Dr. Mulhim al Doori (American University in Dubai)

Credit Points: 1

Contents

Introductory R language fundamentals and basic syntax detailing what R is and how it's used to perform data analysis. It will help you become familiar with the major R data structure and assist you to create your own visualizations using R.

A first R session: Introduction and Data Handling

The aim of this session is to introduce what R is, how it's used to perform data analysis, to become familiar with the major R data structures and to get an overview of R and how it works including:

- R introduction and elimination of R with respect to Matlab and Python (commons, advantages, drawbacks)
- Reading and writing data files
- Important Operations in R
- Useful Miscellaneous Skills
- Entering data
- Vectors and Arrays
- Fundamentals for Spatial Data
 - creating and manipulating raster data
 - vector and raster analysis in R
- Working with 2D & 3D Data in R

B second R session: Statistical analysis

The aim of this session is to introduce statistical analysis of data using R. The session will cover several statistical analysis methods:

- Finding Counts and Percentages
- Ranking, sorting, sub setting, and aggregating data
- Descriptive Statistics
- Frequency tables
- Summary statistics: means, sums, variances, covariances
- Statistical Tests
 - Introduction to Ordinary Least Squares Regression and Pearson correlation
 - t-tests, Wilcoxon tests and Binomial tests for comparing two groups
 - Chi-square and Fisher's Exact tests for two categorical variables
 - One-way ANOVA

C Third R Session:

The session will introduce visualization of data using R and other advanced R functions.

- Plotting and data visualization, including images and maps
 - Tools for image and time series interpretation
- Graphing
 - Graphical methods (including scatterplots, bar charts, pie charts, histograms, box plots and dot charts)
- Customizing every part of a plot: colors, axes, titles, lines, grids, backgrounds, legends, etc.
- Creating more complex plots
 - Saving plots
- Time Series
- regression analysis
- Neural Networks
 - Convolutional Neural Networks (CNNs) for image recognition
 - Implementation of CNNs in R via the MXNetpackage
- Discuss special interests or specific questions/problems from the students

Registration

Please register via [online form](#).

