Refresher Course Mathematics and Statistics

Syllabus

University of Bayreuth
Winter Term 2019/20

Lecturer: Richard Franke
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Organization:

The course will take place at the beginning of the semester and will be taught on five days. On each day there are four lectures. The lectures are divided into a theoretical and a practice part.

- Dates: October 7th, 8th, 9th, 10th, 11th
- Times: 9:00 – 10:30 am, 10:45 am – 12:15 pm, 1:30 – 3:00 pm, 3:15 – 4:45 pm
- Room: S 64 (RW I, EG 1.0.00.110)

The course will be taught in English. Lectures slides and practice questions will be made available beforehand on the e-Learning platform. (https://elearning.uni-bayreuth.de)

Credit points:

There is no credit earned from this course. Students for whom this course is compulsory – as specified in their admission letter – must pass a take home exam. The exam will be made available on the last day.

Prerequisites:

No prior knowledge is required.

Course description:

The main purpose of this course is to provide a fast track refresher in basic mathematics and statistics for Master students of the economic programs at the University of Bayreuth, especially the MA History & Economics. The main focus is on students without a Bachelor degree in economics. The content will cover basic concepts of calculus, linear algebra, analysis, descriptive statistics and inferential statistics that

are needed throughout the Masters program. As this course covers only the basic concepts, no prior knowledge is required. However, the knowledge of these basics will be expected by your lecturers in the Master programs.

Topics covered include:

- Calculus (set theory, functions, differential calculus, ...)
- Linear algebra (vectors, matrices, system of linear equations, ...)
- Analysis (extrema of functions, optimization, integrals, ...)
- Descriptive statistics (random variables, samples, statistical dispersion, ...)
- Inferential statistics (probability distributions, hypothesis testing, ...)

Reading material:

The course does not follow any specific textbook. For further reading, however, you can choose any undergraduate mathematics and statistics textbook, e.g.

- *Essential Mathematics for Economic Analysis**
  by Knut Sydsaeter and Peter Hammond
- *Statistics**
  by David Freedman, Robert Pisani and Roger Purves
- *Statistics for Business and Economics*
  by James T. McClave and P. George Benson

* – Available in the textbook library.