

University of Mannheim
School of Social Sciences

Chair of Political Economy
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Chair of Political Science II
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Math Refresher

Syllabus Fall 2014

Course Description

This course is designed to provide mathematical tools useful for the rest of your Master program in Mannheim, especially for the upcoming, mandatory courses in statistics and game theory. The course reviews some mathematical concepts most of you will be familiar with from high school. We will cover fundamentals in set theory, uni- and (partially) multivariate calculus, linear algebra and probability theory. Each day consists of lectures and exercise sessions. The course's objective is to make students familiar and comfortable reading mathematical statements and applying various mathematical techniques. Students can schedule one-on-one meetings with the instructors to review parts of the material.

Attendance Policy

While the instructors strongly encourage attendance, this course is voluntary. If you decide to participate we expect you to attend the class actively and full time each session.

Schedule

Date	Day	Time	Room
26.08.	Tuesday	8.30-5pm	B 317, A5, 6 Bauteil B
27.08.	Wednesday	8.30-5pm	B 317, A5, 6 Bauteil B
29.08.	Friday	8.30-5pm	B 317, A5, 6 Bauteil B
02.09.	Tuesday	8.30-11.45am	A 103, B6, 23-25 Bauteil A
03.09.	Wednesday	12-5pm	A 303, B6, 23-25 Bauteil A
05.09.	Friday	8.30-5pm	A 102, B6, 23-25 Bauteil A

- Tuesday, 26.08.
 - Arithmetic and Equations
 - Linear Functions
 - Derivatives
- Wednesday, 27.08.
 - Optimization, Comparative Statics
 - Integration
- Friday, 29.08.
 - Set Theory
 - Binary Relations
 - Proofs
- Tuesday, 02.09.
 - Vectors and Matrix Operations
 - Special Matrices
- Wednesday, 03.09.
 - Vector Spaces
 - Systems of Equations
- Friday, 05.09.
 - Probability Theory
 - Probability Distributions

Readings

- General
 - Moore, W. H. & Siegel, D. A. (2013). *A Mathematics Course for Political and Social Research*. Princeton: Princeton University Press
 - Sydsaeter, K. & Hammond, P. (2008). *Essential Mathematics for Economic Analysis*. Essex: Pearson, 3rd edition
- Calculus
 - Simon, C. P. & Blume, L. (1994). *Mathematics for Economists*. New York: Norton and Company, esp. Part I, III, IV
- Probability Theory
 - DeGroot, M. H. & Schervish, M. J. (2011). *Probability and Statistics*. London: Pearson, 4th edition
- Linear Algebra
 - Lay, D. C. (2011). *Linear Algebra and Its Applications*. London: Pearson
 - The Matrix Cookbook¹

¹http://www2.imm.dtu.dk/pubdb/views/edoc_download.php/3274/pdf/imm3274.pdf