

Prof. Dr. N. Perkowski  
<http://www.math.hu-berlin.de/~perkowsk>  
Institute of Mathematics  
Stochastics



In winter term 2015/16 I shall read the following lecture

*Functional Analysis*  
(BMS Course)

This is a BMS course which will be taught in English to facilitate participation of international students.

Content:

Complete metric spaces, compactness, Lebesgue spaces, function spaces, Banach- and Hilbert spaces and their dual spaces, reflexive spaces, strong and weak convergence, convexity, continuous operators, operator topologies, Fourier transform and applications, theorems of Hahn-Banach and Banach-Steinhaus, spectrum of bounded operators, spectral decomposition of compact self-adjoint operators.

Prerequisites:

Modules 4 and 5 „Lineare Algebra und Analytische Geometrie I und II” (linear algebra I + II), modules 1 and 2 „Analysis I, II und III”.

References:

- Alt, H.W. – Lineare Funktionalanalysis, Springer 2012  
(available online via HU-net at <https://doi.org/10.1007/978-3-642-22261-0>)  
Hirzebruch, F., Scharlau, W. – Einführung in die Funktionalanalysis, B.I.-Wissenschaftsverlag 1971  
(available online at <http://hirzebruch.mpim-bonn.mpg.de/117/>)  
Reed, M., Simon, B. – Methods of Modern Mathematical Physics Vol. 1: Functional Analysis, Academic Press 1980  
Rudin, W. – Functional analysis, McGraw-Hill 1991  
Werner, D. – Funktionalanalysis, Springer 2011  
(available online at <https://doi.org/10.1007/978-3-642-21017-4>)  
Tao, T. – Lectures Notes for Courses 245B, 245C  
(available at <https://terrytao.wordpress.com>)

Lectures (N. Perkowski):

Thursday, 09 – 11, RUD 25, room 1.013  
Thursday, 13 – 15, RUD 25, room 1.013

First lectures: **October 15, 2015**

Exercises (N. Perkowski):

Wednesday, 11 – 13, RUD 25, room 1.115

Office hours: by agreement.

There will be a course webpage, cf. <http://www.mathematik.hu-berlin.de/~perkowsk>