Discrete and continuous dynamical systems

Program:

We introduce topological, measure theoretical and functional analytic dynamical systems and investigate properties such as recurrence, ergodicity, mixing. Great emphasis will be on the classical ergodic theorems by von Neumann, Birkhoff and others. The recent ergodic theoretical approach to combinatorial number theory by H. Furstenberg and Terence Tao will be the final goal.

Prerequisites:

Basic concepts and main results from measure theory, topology and functional analysis. Tools from spectral theory will be used frequently.

Suggested reading:

P. Walters: An Introduction to Ergodic Theory. Springer-Verlag 1982.

T. Tao: Ergodic Theory. Lecture Notes 2008. See:
http://terrytao.wordpress.com/category/254a-ergodic-theory/

Textbook:

R. Derndinger, R. Nagel, G. Palm: Ergodic Theory in the Perspective of Functional Analysis. See:
http://www.fa.uni-tuebingen.de/research/publications/1987/ergodic-theory