Department of Mathematics & Statistics
Concordia University

MATH 475 (MAST 661A/865A)

Discrete Dynamical Systems, Chaos and Fractals

Fall 2016

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Office Hours: TBA or by appointment.

Recommended Textbooks:

1) Petersen, Karl, *Ergodic Theory*. Corrected reprint of the 1983 original. 2. *Cambridge Studies in Advanced Mathematics,* Cambridge University Press, Cambridge, 1989.
2) Boyarsky, Abraham; Gora, Paweł, *Laws of chaos: Invariant measures and dynamical systems in one dimension*. *Probability and its Applications,* Birkhäuser Boston, Inc., Boston, MA, 1997.
3) *Fractals Everywhere* by Michael F.Barnsley.

Topics:

1. Introduction to Ergodic Theory
2. Basic Constructions in Ergodic Theory
3. Ergodic Theorems
4. Frobenius-Perron operator and absolutely continuous invariant measures
5. Metric spaces, Hausdorff metric. Iterated Function Systems and their attractors. Computer graphics using IFS attractors. Fractal dimension.

Assignments: Homework will be given weekly and constitutes a very important part of the course. Students are encouraged to use Maple (or other such system) whenever it is applicable. **Late homework will not be accepted.**

Midterm Exam: There will be an in-class test. The exact date of the exam will be announced during the lecture at least two weeks in advance.

Final Exam: To be announced.

Evaluation: The final mark is the maximum of:
20% assignments + 20% midterm test + 60% final exam
100% final exam