Math 797   **Course Policy Summary**   **Fall 2018**

| **Lecture** | #81802 | **TTh 1:00-2:15** | **LGRT 219** | **Hongkun Zhang** |

Hongkun Zhang
Office: LGRT 1335H
Office hours: Friday 1:00-2:00pm
Phone: (413) 545-2871
E-mail: `hongkun@math.umass.edu`
Mailbox: LGRT 1623D

Course description: Dynamical systems is an exciting and very active field in pure and applied mathematics, that involves tools and techniques from many areas such as analyses, probability and number theory. At the beginning of this lecture course we will give a strong emphasis on presenting many fundamental examples of dynamical systems, such as circle rotations, the baker map on the square and the continued fraction map. Driven by the examples, we will introduce some of the phenomena and main concepts which one is interested in studying. We will formalize these concepts and cover the basic definitions and some fundamental theorems and results in topological dynamics, in symbolic dynamics and in particular in ergodic theory.

Prerequisite: Math 623 and Math 645 are preferred.

Topics covered: Measure Theory (review), Measure-preserving Transformations; Recurrence ; Ergodicity; Examples of Ergodic Maps; Ergodic Theorem; Symbolic Dynamics; Mixing; Linear Toral Automorphisms; Lyapunov Exponents, Entropy, Dynamical Systems with Continuous Time. **Texts:** Several textbooks will

be occasionally used in this course. Three most basic ones are

- P. Walters, An Introduction to Ergodic Theory, Springer, 1982

- M. Pollicott, Lectures of ergodic theory and Pesin theory on compact manifolds, Cambridge University Press, 1993

- Yves Coudene, Ergodic Theory and Dynamical Systems, Springer, 2016.

Two other helpful texts are

- M. Pollicott & M. Yuri, Dynamical Systems and Ergodic Theory, Cambridge University Press, 1998

- G. Keller, Equilibrium States in Ergodic Theory, Cambridge University Press, 1998

You do not have to buy these book, although this would be a good idea if you plan to specialize in dynamical systems. I will send out class notes during most of the lectures.

Requirements and grading:

- Take-home **final exam** during final exam period: **60%**

- An in-class **mid-semester exam** on Thursday, Nov 1, 2018: **20%**
  Remark: No make-up exam will be offered.

- **Homework**: **20%** A few homework will be assigned, due in lectures.

The course letter-grade scale is:

A	A−	B+	B	B−	C+	C	C−	D+	D	F
90	87	83	79	75	71	67	63	59	55	< 55