

# Math 8275: Qualifying Exam Syllabus

August 2023 Exam

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Textbook: *Introduction to Dynamical Systems*, by Michael Brin and Garrett Stuck

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## Examples and basic concepts

- The notion of a dynamical system (1.1)
- Circle rotations (1.2)
- Expanding endomorphisms of the circle (1.3)
- Shifts and subshifts (1.4)
- Quadratic maps (1.5)
- Hyperbolic toral automorphisms (1.7)
- The horseshoe (1.8)
- Attractors (1.13)

## Topological dynamics

- Limit sets and recurrence (2.1)
- Topological transitivity (2.2)
- Topological mixing (2.3)
- Expansiveness (2.4)
- Topological entropy (2.5)
- Topological entropy for some examples (2.6)

## Symbolic dynamics

- Subshifts and codes (3.1)
- Subshifts of finite type (3.2)
- Perron-Frobenius Theorem (3.3)
- Topological entropy of an SFT (3.4)
- Substitutions (3.6)
- Sofic shifts (3.7)