MATH 507 Dynamical Systems I Fall 2024 Schedule

Lec.	Date	Topic	Section
1	8/27	Introduction, questions, and examples. Contractions.	1.1
2	8/29	Stability of contractions. Fixed points. Increasing interval maps.	1.1
3	9/3	Circle rotations. Equidistribution. First digits of powers.	1.3, -
4	9/5	Topological transitivity and minimality.	1.3, 1.4
5	9/10	Translations on the torus.	1.4
6	9/12	Topological conjugacy and semiconjugacy.	2.3
7	9/17	Times-m map of the circle.	1.7
8	9/19	Full shift on m symbols.	1.9
9	9/24	Topological mixing. Subshifts of finite type.	1.9
10	9/26	Subshifts of finite type.	1.9
11	10/1	Topological entropy: definition and properties.	3.1
12	10/3	Topological entropy: examples and more properties.	3.2
13	10/8	Hyperbolic automorphisms of $\mathbb{T}^2$ – basics and an example.	1.8
14	10/10	Hyperbolic automorphisms of $\mathbb{T}^2$ – periodic points and entropy.	1.8
15	10/15	Hyperbolic automorphisms of $\mathbb{T}^m$.	
16	10/17	Structural stability. Structural stability of the times-m map.	2.3, 2.4
17	10/22	Structural stability of hyperbolic automorphisms. Hyperbolicity.	2.6
18	10/24	Coding a dynamical system. Smale's horseshoe.	2.5
19	10/29	ω- and α-limit sets. Recurrent points. Minimal sets.	3.3
20	10/31	Non-wandering points. Poincaré Recurrence Theorem.	3.3, 4.1
21	11/5	Circle homeomorphisms and rotation number.	11.1
22	11/7	Circle homeomorphisms: (semi-)conjugacy to rotations.	11, 12
23	11/12	Fractals and fractal dimensions.	
24	11/14	Continuous-time dynamical systems (flows).	
25	11/19	Mixing, recurrence, and entropy for flows. Suspension flows.	
26	11/21	Suspension flows. Equivalence for flows. Flows and vector fields.	
	11/24-30	*Thanksgiving break – no classes.*	
27	12/3	Project presentations.	
28	12/5	Project presentations.	
29	12/10	Project presentations.	
30	12/12	Project presentations.	