MATH 497 Introduction to Dynamical Systems Spring 2024 Schedule

Lec.	Date	Topic
1	1/8	An overview: questions and examples.
2	1/10	Contractions in $\mathbb{R}$.
3	1/12	Contractions in metric spaces. Fibonacci numbers.
	1/15	*Martin Luther King Day - no classes.*
4	1/17	Increasing maps of an interval.
5	1/19	Perturbations. Attracting fixed points. Newton's method.
6	1/21	Periodic points. Circle rotations.
7	1/23	Density and equidistribution of orbits for irrational circle rotations.
8	1/25	First digits of powers.
9	1/29	Times-3 map of the circle.
10	1/31	Numbers in base 3. More on times-3 map. The Cantor set.
11	2/2	Comparing dynamical systems. Structural stability.
12	2/5	Sequence spaces: definitions, distances, and convergence.
13	2/7	Shifts on sequence spaces. Subshifts of finite type.
14	2/9	Properties of subshifts of finite type.
15	2/12	Compactness.
16	2/14	Continuity and compactness. Topological transitivity and minimality.
17	2/16	Recurrent points.
18	2/19	Lebesgue measure.
19	2/21	(Somewhat) mind-bending examples. Measure-preserving maps.
20	2/23	Poincaré Recurrence Theorem. More on recurrent points.
21	2/26	Billiards in convex regions. Billiard in a disc.
22	2/28	Periodic orbits of a billiard map. Billiards in convex polygons.
23	3/1	The two-dimensional torus. Linear flows and translations on the torus.
	3/3-9	*Spring break – no classes*
24	3/11	Linear maps in the plane: models.
25	3/13	Linear maps in the plane: eigenvalues, eigenvectors, and conjugacy.
26	3/15	Topological conjugacy: definition and properties.
27	3/18	Topological conjugacy: examples and non-examples.
28	3/20	More on topological conjugacy and structural stability.
29	3/22	Automorphisms of the torus $\mathbb{T}^2$. Arnold's Cat Map.
30	3/25	Hyperbolic automorphisms of $\mathbb{T}^2$.
31	3/27	Hyperbolic automorphisms of $\mathbb{T}^2$: number of points of period n.
32	3/29	Topological mixing.
33	4/1	Properties of hyperbolic automorphisms of $\mathbb{T}^2$.
34	4/3	Will the image of the cat return? More properties.
35	4/5	Topological entropy: definition and examples.
36	4/8	Problems.
37	4/10	Topological entropy: more examples.
38	4/12	Properties of topological entropy.
39	4/15	
40	4/17	
41	4/19	
42	4/22	
43	4/24	
44	4/27	