

HOLOMORPHIC DYNAMICAL SYSTEMS

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ABSTRACT

This course is an introduction to holomorphic dynamics in dimension one, which studies the recurrence relation $z_{n+1} = f(z_n)$ for f a holomorphic map.

We will cover, according to available time, a selection of the following topics:

In dynamical space

- specific terminology
- Montel's theorem
- local classification of fixed points
- Characterizations of the Julia set
- coverings and ramified coverings
- Fatou's theorems relating critical points and the the Fatou set
- The Fatou-Shishikura inequality
- Sullivan's non-wandering theorem
- Combinatorics via external rays

In parameter space

- analytic families
- the Mandelbrot set
- holomorphic motions
- density of the stability locus

PREREQUISITES

Definition and basic properties of holomorphic functions.

REFERENCES

J. Milnor. *Dynamics in one complex variable*. Princeton University Press, 3rd Edition.

L. Carleson, T.W. Gamelin. *Complex Dynamics*. Universitext, Springer.