Holomorphic dynamics in dimension one : an introduction

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Abstract:
These lectures aim to provide an introduction to the Fatou-Julia theory of iteration for rational functions or polynomials in one complex variable. The classical analytical approach and the ergodic one will both be treated.

1. The Fatou-Julia dichotomy.
2. Invariant measures. Ergodicity. Mixing.
3. Density of repelling cycles.
4. Birkhoff ergodic theorem.
5. Hyperbolic rational functions.
6. Green measure of a rational function.

Prerequisites:
Elementary topology, Complex analysis, Functional analysis, Measure theory.

References:
1. F. Berteloot and V. Mayer, *Rudiments de dynamique holomorphe.* Société Mathématique de France, Paris, 2001.
2. X. Buff and J.H. Hubbard,*Dynamics in one complex variable.* Matrix Edition, Ithaca, NY (to appear).
3. Y. Coudène, *Théorie ergodique et systèmes dynamiques.* EDP-Sciences, 2013.
4. J. Milnor *Dynamics in one complex variable.* Third edition. Annals of Mathe matics Studies, 160. Princeton University Press, Princeton, NJ (2006)
5. M. Viana, *Lectures on Lyapunov exponents* Cambridge studies on advanced mathematics, 2015.