Syllabus

Functions of Complex Variables 2

Joseph Bernstein March 10, 2004

Syllabus

1. Generalities on holomorphic functions
2. Principle of analytic continuation
3. Gamma functions (Gauss formula, product expansion, Stirling formula).
4. Weierstrass product expansion.
5. Functions of finite growth. Hadamard factorization theorem.
6. Harmonic functions
7. Weierstrass $\mathfrak{P}$-function. Elliptic functions.
8. Theta functions, modular forms, Jacobi identity.
9. Conformal mappings: exercises, Riemann mapping theorem, continuity at the boundary.
10. Riemann ζ function and prime numbers theorem
11. Picard theorem
12. Hartog's theorem

We will mostly follow the books

1. Complex Analysis by L. Alhfors
2. Classical Topics in Complex Function Theory by R. Remmert