

Complex Function Theory

Exam Program

Warwick University, 2017/2018

1. Complex analysis notions and tools: holomorphic functions, Taylor series convergence tests, Cauchy integral, residue formula, Möbius transformations, Riemann mapping theorem;
2. Harmonic functions, Poisson kernel, and Poisson extensions;
3. Nontangential limit, Fatou theorem
4. Hardy space and connection between harmonic functions and Hardy space functions
5. Weighted Hardy spaces, Bergman space, and Dirichlet space;
6. Marzinkiewicz interpolation theorem and Vitali lemma
7. Hardy–Littlewood maximal theorem; nontangential maximal function
8. Reproducing kernels, algebra of multipliers, zero sets
9. Harnack’s inequality, Jensen’s inequality, subharmonicity criterion;
10. Harmonic majorants;
11. Blaschke products, inner functions, outer functions;
12. Canonical factorization theorem;
13. Shift operator, projection operator, distance functional;
14. Beurling theorem;
15. Optimal polynomial approximants;
16. Pseudohyperbolic distance and Schwarz lemma;
17. Interpolation problems, interpolating sequences, and Carleson measures;
18. Carleson embedding theorem;
19. Carleson interpolation theorem.