

DEPARTMENT OF MATHEMATICS

SYLLABUS

Course # & Name: Mathematics 185A Complex Analysis with Applications

Recommended Text(s) & Price: Basic Complex Analysis, Marsden & Hoffman, 3rd edition \$122.35 (list price)

Prepared by: D. Coutand & B. Nachtergaele UPC Approval Date: October 2003

Lecture(s)	Sections	Comments/Topics
1-2	1.1-1.3	Complex number system
3-4	1.4	Review continuous functions
5-6	1.5	Basic properties of analytic functions
7	1.6	Differentiation of elementary functions
8	2.1	Contour Integrals
9-10	2.2-2.3	Cauchy's Theorem
11-12	2.4	Cauchy's Integral Formula
13-14	2.5	Maximum Modulus Principle and harmonic functions
15	3.1	Convergent series of analytic functions
16-17	3.2	Power series and Taylor's Thm
18-19	3.3	Laurent series and classification of singularities
20-21	4.1	Calculation of residues
22-23	4.2	Residue Thm
24-25	4.3	Evaluation of definite integrals
26-27	4.4	Evaluation of infinite series

Additional Notes:

Chapters 1-4

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Lecture(s)	Sections	Comments/Topics
1-2	5.1	Basic theory of conformal mappings
3-4	5.2	Fractional linear transformations
5-7	5.3	Applications of conformal mappings
8-10	6.1	Analytic continuations and Riemann surfaces
11-12	6.2	Rouche's Thm and Principle of the Argument
13-14	6.3	Mapping properties of analytic functions
15-17	7.1	Infinite products and the Gamma function
18-20	7.2	Asymptotic expansions and the Method of Steepest Descent
21-22	7.3	Stirling's formula etc.
23-24	8.1	Basic properties of the Laplace Transform
25	8.2	Complex Inversion Formula
26-27	8.3	Applications of the Laplace Transform

Additional Notes:

Chapters 5-8