

# Lecture notes for Several Complex Variables Spring 1991

BY CHARLES L. EPSTEIN

## **Chapter 1 One complex variable, for adults**

- 1.1 Introduction
- 1.2 Review of Functional Analysis
- 1.3 The Cauchy integral formula, holomorphic functions
- 1.4 Elementary facts about analytic functions of one variable
- 1.5 The Runge approximation theorem, the holomorphic convex hull
- 1.6 Solving the  $\bar{\partial}$ -equation
- 1.7 The Mittag-Leffler and Weierstraß Theorems, domains of holomorphy

## **Chapter 2 Elementary properties of holomorphic functions in several variables**

- 2.1 Holomorphy for functions of several variables
- 2.2 The Cauchy formula for polydiscs and its elementary consequences
- 2.3 Hartogs' Theorem on separately holomorphic functions
- 2.4 Solving the  $\bar{\partial}$ -equation in a polydisc and holomorphic extension
- 2.5 Local solution of the  $\bar{\partial}$ -equation for  $p, q$ -forms
- 2.6 Power series and Reinhardt domains
- 2.7 Domains of holomorphy and holomorphic convexity
- 2.8 Pseudoconvexity, the ball versus the polydisc
- 2.9 CR-structures and the Lewy extension theorem
- 2.10 The Weierstraß preparation theorem

## **Chapter 3 The complete metric approach to the $\bar{\partial}$ -problem**

- 3.0 Introduction
- 3.1 The geometry of the unit ball
- 3.2 Analysis of Bergman Laplacian
- 3.3 Polyhomogeneous conormal distributions
- 3.4 A simple model for blow-ups
- 3.5 Parabolic blow-ups for the model problem
- 3.6 The  $\Theta$ -tangent bundle and parabolic blow-ups

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