

TOPICS IN ANALYSIS IN SEVERAL COMPLEX VARIABLES

Instructor: Charles Favre, charles.favre@polytechnique.edu

Lectures: Tu & Th 11:00 – 12:30. MATH 105.

Office hours: Tu & Th 14:00 – 15:30 or by appointment

Credits: 3

Course Outline.

- Part 1: Basics on holomorphic functions in several complex variables (3 weeks)
- Part 2: Analytic subsets in complex manifolds (3 weeks)
- Part 3: Subharmonic and Plurisubharmonic functions (2 weeks)
- Part 4: L^2 -methods to solve the $\bar{\partial}$ -operator and the Levi problem (2 weeks)
- Part 5: (if time allows) Currents and applications (2 weeks)

Text.

The main reference for the course is

L. Hörmander, *An introduction to complex analysis in several variables*. ISBN-13 : 978-0444884466

This book is available online through UBC library subscription. Other textbooks include:

- J.-P. Demailly. *Complex analytic and differential geometry*.
- R. C. Gunning. *Introduction to Holomorphic Functions of Several Variables, Volume I: Function Theory & Volume II: Local Theory*.
- E.-M. Chirka. *Complex analytic sets*.
- L. Kaup and B. Kaup. *Holomorphic functions of several variables: an introduction to the fundamental theory*.

Learning goals. The course is an introduction to analysis in several complex variables, and students are expected to master the following notions and technics at the end of the course: $\bar{\partial}$ operators on functions and forms; analytic implicit function theorem; Reinhardt domains; Hartog's extension theorem; domains of holomorphy; analytic sets; Weierstrass preparation theorem; Oka and Cartan's coherence theorems; plurisubharmonic functions; pseudo-convex domains; Hörmander's L^2 -technics for solving the $\bar{\partial}$ -equation.

Evaluation. Grades will be based two homework problems sets (one at mid-term and one at the end of the course). Weekly homework exercises will be also assigned but not graded.

Course policies.

Missing homework: If you miss the homework's deadline, there is no make-up homework and you will receive a mark of 0 points for the missed homework assignment unless there is a valid reason for missing this homework. Examples of valid reasons include illness and travel to play a scheduled game for a varsity team. Examples of reasons that are not valid include conflicts with personal travel schedules or conflicts with work schedules. Any student who misses the homework assignment is to present to their instructor the Department of Mathematics self-declaration form (available on my website) for reporting a missed assessment to their instructor within 72 hours of the due date for the assignment. In the case of missing the assignment for a valid reason, the weight of this assignment will be evenly distributed among the 3 tests administered in this course.

Academic Misconduct.

1. While students are encouraged to study together, they should be aware that blatant copying of another student's work is a serious breach of academic integrity. Please discuss with your instructors their expectations for acceptable collaboration on any assigned coursework. Cases of suspected cheating will be investigated thoroughly.
2. Note that academic misconduct includes misrepresenting a medical excuse or other personal situation for the purposes of postponing an examination or quiz or otherwise obtaining an academic concession.

Statement on UBC's Policies and Resources to Support Student Success.

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available at <https://senate.ubc.ca/policies-resources-support-student-success>