

MATHEMATICS 961 - FUNCTIONAL ANALYSIS II
FALL 2020

- **Instructor:** Professor Atanas Stefanov
- **Office:** Snow 514, Phone: 4-3009
- **Office Hours** R 11:00-12:00 or by appointment. Office hours are on ZOOM.
- **Web:** stefanov@ku.edu,
https://stefanov.ku.edu/Math_961_Fall_2020.html
- **Prerequisite:** Math 960.
- **Organization of the class meetings:** **The first two weeks will be online only.** After that, starting on September 8th, the class meets on Tuesday at 2:30 p.m. in person at room Mallott 2048, it meets online via ZOOM on Thursday at 2:30 p.m., for the remainder of the semester.

To protect all of us, everyone must wear a mask in the classroom as required by the Protect KU Pledge and by University policy. Violations of the mask policy in classrooms are treated as academic misconduct. If you come to class without a mask, I will ask you to put one on. If you do not put on a mask when asked, you will have to leave class. Violations will be reported, and consequences will follow, up to and including suspension from the course.
- **Text:** Functional Analysis (Graduate Studies in Mathematics), by T. Bühler and D. Salamon, ISBN-10: 147044190X, ISBN-13: 978-1470441906
Freely available online at:
<https://people.math.ethz.ch/~salamon/PREPRINTS/funcana-ams.pdf>
- **Topics**
 - Spectral theory (Chapter V): We start with a review: spectrum, holomorphic functional calculus, operators on Hilbert spaces, functional calculus for self-adjoint operators. The new material will include spectral measures and the spectral theorem for self-adjoint operators.
 - Unbounded operators (Chapter VI): unbounded operators on a Banach space, the dual of an unbounded operator, unbounded operators on a Hilbert spaces, functional calculus.
 - Semigroups of operators (Chapter VII): C_0 semigroups, generators; Hille-Yosida theorem for the generators; Analytic semigroups, Banach space valued measurable functions, inhomogeneous equations, Duhamel's principle, maximal regularity.
- **Homework:** There will be five homework assignments per semester, consisting of about 6-10 problems each, covering specific portions of the material.

No final exam will be given, but the final HW assignments will be in lieu of a final and it will be due on the day of the final exam.

Note that group work is preferred - groups of two or three students will submit one copy of their work and everybody will be assigned the same grade. Each student must be a lead on at least 2 problems!