Math 64600: Functional Analysis
(Class No: 33010)

Meets: Th 3:00 – 5:30p online via Zoom   Format: DO
Final Exam: No Final Exam   **Last Class:** Thursday, November 19

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Office Hours: M Tu 1:30-3:00p, W 12:00-1:30p, or by appointment
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Advanced Functional Analysis is a topics course in analysis at an advanced level and is a sequel to Intro to Functional Analysis, Math 54600. In Fall 2020, this will be a reading course that will begin with an introduction to Banach and C^*-algebras, the latter being an abstraction of the algebra of bounded operators on a Hilbert space. This can be seen as a continuation of the last part of Math 54600. At the beginning, we will redo the spectral theorem for self-adjoint operators from a more abstract point of view, in a way that takes advantage of the C^*-algebra structure. We will also develop the idea of the maximal ideal space, which can be identified as the set of (non-zero) multiplicative linear functionals on a Banach algebra.

In the rest of the course, we will discuss the areas of functional analysis and operator theory that are of further interest to the students taking the course.

Resources

There will not be an "official" textbook for this course; most of the material we will use will come from books in the library or books Cowen owns.

The following books cover some of the material that is central, in my view, to this course, but they each have different perspectives the general subject and have chosen different topics to include in their books. They may be useful references for the course. The books marked with an asterisk(*) will be on reserve for this course in the IUPUI library.

J. B. Conway	*A Course of Functional Analysis**
J. B. Conway	*A Course in Operator Theory*
R. G. Douglas	Banach Algebra Techniques in Operator Theory
R. G. Douglas	Banach Algebra Techniques in the Theory of Toeplitz Operators
R. E. Megginson	*Introduction to Banach Space Theory**
A. Taylor and D. Lay	*Introduction to Functional Analysis*
P. R. Halmos	*Introduction to Hilbert Space* $\cdots$*
P. R. Halmos	*Hilbert Space Problem Book**
W. Rudin	*Functional Analysis**

The following books are classics, in my view, and might be useful references, but none of these books is on reserve in the library.

Dunford and Schwartz	*Linear Operators* (3 Volumes)
Riesz and Sz. Nagy	*Functional Analysis*
K. Yosida	*Functional Analysis*

Campus Course Policies

IUPUI has certain policies that apply to every course; this course will follow these policies also. Students should be familiar with the policies; they may be found at
        http://registrar.iupui.edu/course_policies.html