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# Advanced Functional Analysis – MAA7527 – Spring 2025

## Time and Location

MWF 4, Little 207

Office hours: TBA

## Description and Goals

**Prerequisites:** MAA 6616-7 (Measure Theory and Functional Analysis) or consent of the instructor.

**Topics:** This course is a continuation of MAA7526. The two-semester sequence will serve as an introduction to the theory of linear operators on Hilbert space. We will discuss Banach algebras, operators on Hilbert space, compact operators and Fredholm theory, the Spectral Theorem, and the basics of  $C^*$ -algebras and von Neumann algebras. After this there are many options for further topics (continuing into the second semester), which will be chosen based on time and interest; these may include positive maps and dilation theory, unbounded operators, K-theory for  $C^*$ -algebras, etc.

**Texts:** No text is required. During the first semester I will be loosely following  $C^*$ -algebras and Operator Theory by Gerard J. Murphy. I expect to cover most of the first four chapters, with occasional additions or deletions. Additional references will be the book Analysis Now by Gert K. Pedersen and A Course in Functional Analysis by John B. Conway. I will suggest further references for certain topics as the course proceeds.

**Schedule:** A weekly schedule will be posted on the Canvas page as the course progresses.

## Homework

*“Because thought has by now been perverted into the solving of assigned problems, even what is not assigned is processed like a problem.” –Theodor Adorno*

There will be a total of 12-15 homework problems assigned through the semester.

## Grades

Grading will be trivial provided you participate and do the homework.

## Attendance

Attendance is recommended.

## University policies and resources

**Grades:** Grading will be in accord with the UF policy stated at <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

**Honor Code:** UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The [Honor Code](#) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

**Class Attendance:** Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

**Accommodations for Students with Disabilities:** Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. See the “[Get Started With the DRC](#)” webpage on the Disability Resource Center site. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

**Online Evaluations:** Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at

<https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via

<https://ufl.bluera.com/ufl/>. Summaries of course

evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

### Health and Wellness resources:

- U Matter, We Care: If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter We Care](#) website to refer or report a concern and a team member will reach out to the student in distress.

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- **Counseling and Wellness Center:** Visit the [Counseling and Wellness Center](#) website or call 352-392-1575 for information on crisis services as well as non-crisis services.
- **Student Health Care Center:** Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the [Student Health Care Center](#) website.
- **University Police Department:** Visit [UF Police Department](#) website or call 352-392-1111 (or 9-1-1 for emergencies).



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