

COURSE DESCRIPTION
SPECTRAL THEORY
MA 747-2E
SPRING 2026

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

Course Instructor: Rudi Weikard
Office: UH 4032
Zoom: <https://uab.zoom.us/my/rudi.weikard>
E-mail: weikard@uab.edu
Office Hours: Drop in anytime or e-mail for an appointment

Meeting times: TR 14:00 pm – 15:15 pm
Meeting location: UH 4004
Prerequisite: Grade of B or better in MA 646 or permission by instructor
Credits: 3 semester hours
Textbook: No textbook required. Lecture notes will be provided.
Canvas: <https://www.uab.edu/elearning/canvas/>

Important dates:

First day of classes: January 12
Martin Luther King Holiday: January 19
Midterm Exam: March 5
Spring Break: March 9 – March 15
Last day of classes: April 24
Final Exam: April 28, 1:30 pm – 4:00 pm
Grades available online: May 6

Course content:

- Hilbert spaces
 - Linear relations
 - Extension theory
 - The spectral theorem
 - Sturm-Liouville equations
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Aims of the course:

The course aims for students to attain *conceptual understanding* and *procedural fluency* with regard to the spectral theory of linear relations. *Conceptual understanding* is demonstrated by the ability to explain in detail the solutions of homework and exam problems. *Procedural fluency* is demonstrated by exercising routine tasks

Date: December 31, 2025.

in an assured and timely fashion. The course also emphasizes *critical thinking* and *communication skills*, both written and verbal.

Methods of teaching and learning:

- 28 class meetings of 75 minutes with presentations by the instructor as well as by students.
- A significant time commitment (certainly more than class time) is to be expected.
- Working in groups is encouraged but not required.

Assessment procedures:

The total score for the course comprises the exam scores weighted at 33% (midterm) and 67% (final). To receive an A, B, or C you will need 90%, 75%, and 50% of the total score, respectively.

Course policies:

- Please make sure that you are able to receive e-mails through your Blazer-ID account. Official course announcements may be sent to that address.
- No internet access will be allowed during the exams.
- You may use the lecture notes as well as your own notes during the exams.

Tips:

- By working steadily and regularly, you will increase your chances to succeed in this course.
- Remember, being a full-time student is a full-time job.
- Seek help when you need it.

Disability Support Services

UAB is committed to providing an accessible learning experience for all students. If you are a student with a disability that qualifies under the Americans with Disabilities Act (ADA) and/or Section 504 of the Rehabilitation Act, and you require accommodations, please contact Disability Support Services for information on accommodations, registration and procedures. Requests for reasonable accommodations involve an interactive process and consist of a collaborative effort among the student, DSS, faculty and staff. If you are registered with Disability Support Services, please contact me to discuss accommodations that may be necessary in this course. If you have a disability but have not contacted Disability Support Services, please call (205)934-4205 or visit <http://www.uab.edu/dss>.

Title IX Statement The University of Alabama at Birmingham is committed to providing an environment that is free from sexual misconduct, which includes gender-based assault, harassment, exploitation, dating and domestic violence, stalking, as well as discrimination based on sex, sexual orientation, gender identity, and gender expression. If you have experienced any of the aforementioned conduct, we encourage you to report the incident. UAB provides several avenues for reporting. For more information about Title IX, policy, reporting, protections, resources and supports, please visit the UAB Title IX webpage for UAB's Title IX Sex Discrimination, Sexual Harassment, and Sexual Violence Policy; UAB's Equal

Opportunity and Discriminatory Harassment Policy; and the Duty to Report and Non-Retaliation Policy.