

COURSE DESCRIPTION
REAL ANALYSIS I
MA 645-2B
FALL 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 or e-mail for an appointment

Meeting times TT 9:30 am – 10:45 am
Meeting location UH 4002
Prerequisite Grade of B or better in MA 642 and MA 670 or equivalent
Credits 3 semester hours
Textbook Ghatasheh, Redolfi, and Weikard: Measure and Integration, Academic Press, 2026
Canvas <https://www.uab.edu/elearning/canvas/>

Important dates:

First day of classes August 25 (for this class)
Labor Day holiday September 7
Fall/Thanksgiving break November 23 – 29
Last day of classes December 3 (for this class)
Final Exam time slot December 10, 8:00 am — 10:30 am
Grades available online December 16

Course content:

- Abstract Integration
 - Construction of Measures
 - Product Measures
 - Complex and Local Measures
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Aims of the course:

The course aims for students to attain *conceptual understanding* and *procedural fluency* with regard to the concepts of measure and integration and their applications. *Conceptual understanding* is demonstrated by the ability to explain in detail the proofs of many of the standard theorems. *Procedural fluency* is demonstrated by exercising routine tasks in an assured and timely fashion. The course also emphasizes *critical thinking* and *communication skills*, both written and verbal.

Date: August 15, 2026.

Methods of teaching and learning:

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

Assessment procedures: There are no quizzes or tests. Neither is there a Final Exam. Points are earned through presentations of topics from the textbook according to the following rules:

- (1) The correct presentation of a topic will earn 10 points. It is advised to write out the proof on paper beforehand. You may use help freely when devising your proofs but you should first try to think of a solution yourself.
- (2) While presenting proofs you may only refer to results listed in the Appendices of the textbook or to those theorems that occur before the one you are working on.
- (3) The audience (including the instructor) may challenge a statement made in the course of a proof at any point.
- (4) If the presenter is able to defend the challenged statement, he or she proceeds; if not, the presenter must sit down earning no points for this problem and losing the right to present again that day. The challenger may then present his or her solution to the topic at hand.
- (5) The successor of a presenter will be chosen as the student with the smallest number of points among the volunteers taking into account the modification by rules (4) and (6). A random choice is made, if necessary.
- (6) You may volunteer for a particular topic by an e-mail to me. This (in the order received) establishes priority among volunteers with the same number of points.
- (7) You must give credit where credit is due, i.e., during your presentation you must declare the points at which you had help and by whom.
- (8) It is also possible to report joint work with one or two collaborators. In such a case 4 points will be earned for the presentation while the other 6 points are evenly distributed among the collaborative (including the presenter).
- (9) Class attendance and participation is required. Absences from class are recorded. After 3 absences from class 10 points will be subtracted from your score and the count of absences is set again to zero.
- (10) Exercises will not be covered in class.

Letter grades: If we cover all material in Chapters 1 – 4, the student with the highest score S will receive an A. An A, B, or C is earned by anyone who has at least 90%, 70%, or 50% of S , respectively. Should we fall short of covering all material the highest score will earn a B.

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.