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# MATH 5345

## Historical Approach to Real Analysis

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**COURSE PREREQUISITES:** Math 5337 with a grade of C or above or consent of the instructor.

**COURSE GOALS and OBJECTIVES:** The purpose of this course is to understand the conceptual foundations in the historical development of mathematical analysis. To this end we focus on

- following a historical progression of the early definitions and theorems of analysis;
- developing careful definitions only after exposing drawbacks of geometric and intuitive understandings of continuity, limits, and series;
- mistakes that have been made historically to highlight difficult conceptual points; and
- inquiry, experimentation, and misunderstandings as essential components in the development of mathematics.

### ELECTRONIC COMMUNICATION STATEMENT:

UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

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### FALL 2017

T 5:30-8:20 in PKH 302

Instructor: **Dr. J. Álvarez**

E-Mail: [james.alvarez@uta.edu](mailto:james.alvarez@uta.edu)

Phones: 817-272-5047 (office)

817-272-3261 (math dept.)

Office: PKH 404

Office Hours: T 3:30-5:00 & by appt.

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Website: <http://web.uta.edu/faculty/alvarezja>

Blackboard: <https://elearn.uta.edu>

Faculty Profile:

<http://www.uta.edu/profiles/james-epperson>

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### TEXTBOOK:

*A Radical Approach to Real Analysis*  
(Second Edition)

David Bressoud

(ISBN-13: 978-0-88385-747-2)

Published by the Mathematical  
Association of America.

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### MATERIALS:

Graphing Calculator (non-CAS for exams)

Wolfram Mathematica® (Optional)

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### GRADES

<b>Exam I</b>	15%
<b>Exam II</b>	15%
<b>Written Assignments/ Homework</b>	45%
<b>Attendance/Engagement and Contribution</b>	10%
<b>Final Exam</b>	15%
<b>Total</b>	100%

**CLASS FORMAT:** Each class will consist of a combination of lectures and some collaborative work. Occasionally we will meet in the computer lab.

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#### DETAILS ABOUT THE COURSE

Grades will be assigned using the following	90-100	A
scheme (approximate):	80-89	B
	70-79	C
	60-69	D
	59 or Below	F

**HOMEWORK and EXAMS:** Textbook homework will be given each Tuesday over sections covered in class. For the homework assigned on a given Tuesday, you can (optional) hand in two exercises from the assigned homework for more feedback. These are handed in at the class meeting the following Tuesday. Your homework set (all assigned problems\*) will be due at three different intervals established in the course outline below. A selected portion of the submitted homework will be graded.

\*Homework will also consist of, but not be limited to, write-ups of problems discussed in class, write-ups of problems worked independently outside of class, summaries and responses to readings of journal articles, and presentations of assigned problems. Periodically, you may be asked to write a reflection about topics in analysis or the teaching of topics historically linked to analysis.

There are supplemental files provided by the author for explorations from the textbook at <http://www.macalester.edu/aratra/index.html>. You will need access to Mathematica® or Maple to open some of the files. The UT System has arranged to sell annual student licenses for software such as Mathematica®. Please see [www.hied.com/utarlington](http://www.hied.com/utarlington) for more information. The student license is currently \$34.99. However, you can use Mathematica® in the labs at UTA or check to see if your school district has a site license and if you can use it on your personal machine.

You are encouraged to discuss and work on the homework in groups as we will often do in class, but each of you should always submit individual work.

Exams will be cumulative in nature. Exams I and II will be take-home exams.

**LATE WORK:** In general, late work will not be accepted.

**ATTENDANCE:** Much of our time will rely on you actively participating in small and large group discussions. Thus, your participation grade will depend heavily on your attendance and your active participation in all discussions. You are expected to be in class, on time, each day. Students missing class for a university event, religious reason, or other 'pre-scheduled' reason must contact the instructor prior to the event and discuss reasonable accommodations. Everyone begins with 100 attendance points. Six points will be *deducted* for each absence. If you contact the instructor prior to the beginning of class (and receive confirmation of receipt of message), only three points will be deducted for that day's absence. Three points will be *deducted* for each tardy after the first. If you leave class early, or choose not to participate, points will be *deducted* accordingly.

**HELP OUTSIDE OF CLASS:** My office hours are listed on the first page of this syllabus. These are times when I will be available, in my office, to discuss the material/homework/tests. No appointment is necessary for those times. If, however, those times are inconvenient for you, then please make an appointment with me for another time (e.g., e-mail me stating the times you prefer). Please use the subject heading "MATH 5345 Student Question" when sending Dr. Álvarez an e-mail and identify yourself (full name) in the communication.

**If at any time you have questions, please do not hesitate to ask.**

**Personal Technology Use:** Cellular phones should either be switched off or set to silent mode during all class meetings. Cellular phone use will not be permitted during class unless you are using it to access an APP such as Desmos or GeoGebra. If you must take an important phone call, please leave the classroom. Cellular phone use is prohibited during exams (this means you may not use your phone as a calculator!!). If you have a watch, or other device, that beeps please turn this off during class meetings as it is disruptive for other students. Students must request permission to use a laptop or tablet during class. Inappropriate use will result in loss of this privilege.

**Drop Policy:** Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://web.uta.edu/aao/fao/>).

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**COURSE SCHEDULE<sup>1</sup>:**

Date	Sections Studied
August 29	Chapter 1: Sections 1.1 & 1.2; Chapter 2: Sections 2.1 & 2.2
September 5	Chapter 2: Section 2.3
September 12	Chapter 2: Review & Section 2.4
September 19	Chapter 2: Section 2.4 & 2.5
September 26	Chapter 2: 2.5 & 2.6
October 3	EXAM I
October 10	First Homework Set DUE Chapter 3: Section 3.1
October 17	Chapter 3: Section 3.2
October 24	Chapter 3: Section 3.3
October 31	Chapter 3: Section 3.4
November 7	EXAM II
November 14	Second Homework Set DUE Chapter 3: Section 3.5
November 21	Chapter 4: Section 4.1 & 4.2
November 28	Chapter 4: Sections 4.3 & 4.4
December 5	Chapter 4: Section 4.4 & Review
December 12	FINAL EXAM, Third Homework Set DUE

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<sup>1</sup> As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled. – Dr. James A. Mendoza Álvarez

**Disability Accommodations:** UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA)*, *The Americans with Disabilities Amendments Act (ADAAA)*, and *Section 504 of the Rehabilitation Act*. All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a **letter certified** by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

**The Office for Students with Disabilities (OSD)** [www.uta.edu/disability](http://www.uta.edu/disability) or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at [www.uta.edu/disability](http://www.uta.edu/disability).

**Counseling and Psychological Services (CAPS)** [www.uta.edu/caps/](http://www.uta.edu/caps/) or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

Student responsibility primarily rests with informing faculty **at the beginning of the semester and in providing authorized documentation through designated administrative channels.**

If you require an accommodation based on disability, I would like to meet with you in the privacy of my office, during the first week of the semester, to make sure you are appropriately accommodated.

**Non-Discrimination Policy:** *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit [uta.edu/eos](http://uta.edu/eos).*

**Title IX Policy:** The University of Texas at Arlington (“University”) is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit [www.uta.edu/titleIX](http://www.uta.edu/titleIX) or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or [jmhood@uta.edu](mailto:jmhood@uta.edu).*

**Academic Integrity:** Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

*I pledge, on my honor, to uphold UT Arlington’s tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.*

*I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.*

UT Arlington faculty members may employ the Honor Code in their courses by having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work

**If at any time you have questions, please do not hesitate to ask.**

submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University. Additional information is available at <https://www.uta.edu/conduct/>.

**Final Review Week:** A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

**Emergency Exit Procedures:** Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit (located to the right as we exit our classroom). When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.

**Campus Carry:** Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>

**Student Feedback Survey:** At the end of each term, students enrolled in classes categorized as lecture, seminar, or laboratory shall be directed to complete a Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

**Important Dates:**

<b>First Day of Classes</b>	29 August
<b>Census Date</b>	11 September
<b>Drop Date</b>	1 November, by 4 pm
<b>Thanksgiving Holiday</b>	23-24 November
<b>Last Day of Classes</b>	05 December
<b>Final Exam</b>	12 December, 5:30-8:00 pm