 University of Texas at Dallas

Course Syllabus

Math 6301: Real Analysis I, Fall 2014

Time and Location:	Tues & Thurs 5:30–6:45 pm	FO 1.502
Instructor:	Wieslaw Krawcewicz	Professor
Contact Information:		
	• Office:	FO 2.602F
	• Phone:	972-883-6620
	• Email:	wieslaw@utdallas.edu
	• Office hours:	Tues & Thurs 3:00–4:00 pm
		or by appointment.
Prerequisites:	MATH 5302	

Course Description:

MATH 6301 – Real Analysis (3 semester credit hours) Lebesgue measure in finite- dimensional spaces, Abstract measures, measurable functions, convergence a.e., Egorov's Theorem, convergence in measure, Lebesgue integral, Lebesgue's bounded convergence theorem, Levi's monotone convergence theorem, Fatou's Lemma, Fubini's theorem, Lp-spaces. Prerequisite: MATH 5302. (3-0) Y

Textbook:

- Stanisław Łojasiewicz, *An Introduction to Theory of Real Functions*, Willey-Interscience, 1988.

Since this book is presently out of print, use the link <http://bookzz.org/book/688044/53a433> to download a soft copy of the textbook.

Homework Assignments:

There will be about 6-8 mandatory graded assignments. Assignments will contribute 20% to your final grade. The homework assignments will be published at our website and you will

be given approximately 7 days to complete your solutions. You will be required to hand your homework to your instructor in class on the due-dates. There will be NO late homework accepted.

Grading Policy:

- Homework assignments: 20%
- Midterm Exam 1: 25%
- Midterm Exam 2: 25%
- Final Exam: 30%
- Total: 100%

Grade Scale:

A	$[95\ldots100]$	A -	$[88\ldots94]$	B+	$[78\ldots87]$
B	$[73\ldots77]$	B-	$[66\ldots72]$	C+	$[60\ldots65]$
C-	$[55\ldots59]$	D+	$[50\ldots54]$	D	$[47\ldots49]$
D-	$[45\ldots46]$	F	$[0\ldots44]$		

Midterm Exams:

	Date	Time	Location
Midterm Exam 1:	Oct. 2, 2014	5:30–6:45 pm	FO 1.502
Midterm Exam 2:	Nov. 4, 2014	5:30–6:45 pm	FO 1.502

Exams Rules: Textbooks, notes, mobile phones, iPhones, scientific calculators or other electronic devises won't be allowed during examination. Rules governing the proper academic conduct and student's integrity will be strictly observed. Cheating and plagiarism won't be tolerated.

Student Learning Objectives:

- Students will demonstrate their well-preparedness for this course by reviewing the related parts of Math 5301 (metric spaces and compactness) and Math 5302 (functions of bounded variations and Riemann-Stieltjes integration).

- Students will learn the fundamental concepts and the fundamental results of measure theory and integration.

- Students will learn several proofs of classical results in measure theory and Lebesgue integration.

- Students will learn how to use the learned results to solve problems related to the measure theory and integration.

Detailed Description of the Course

1. **Review:** *Infima* and *suprema*, *limits* and *principle of choice*.

2. **Review:** Functions of *bounded variations* and *Jordan canonical decomposition*.

3. **Review:** *Riemann-Stieltjes* integral: existence and computations.

4. **Review:** *Metric spaces*, *compactness* and functions on metric spaces.

5. *Equicontinuous* families of functions, Arzela-Ascoli theorem.

6. Upper and lower *semicontinuous* functions and their properties.

7. Functions of *First Class of Baire*.

8. *Algebras* of sets and *measurable* functions.

9. *Measure* and *measurable* sets, intervals in $\mathbb{R}^n$, Lebesgue measure and fundamental theorems.

10. Integration with respect to a measure, Lebesgue integral, fundamental theorems for Lebesgue integral and L^p spaces.

11. Selected topics on differentiation.

Additional Information

Technical Support: If you experience any problems with your UTD account you may send an email to: assist@utdallas.edu or call the UTD Helpdesk at 972 883-2911.

Student Conduct & Discipline: The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and

regulations, which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD printed publication, A to Z Guide, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the Rules and Regulations, Series 50000, Board of Regents, The University of Texas System, and in Title V, Rules on Student Services and Activities of the universitys Handbook of Operating Procedures. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391) and online at http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-HOPV.html

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

Academic Integrity: The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrates a high standard of individual honor in his or her scholastic work.

Scholastic Dishonesty, any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the universitys policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Copyright Notice: The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials, including music and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe the copyright owners rights and such infringement is subject to appropriate disciplinary action as well as criminal penalties provided by federal law. Usage of such material is only appropriate when that usage constitutes fair use under the Copyright Act. As a UT Dallas student, you are required to follow the institutions copyright policy (Policy Memorandum 84-I.3-46). For more information about the fair use exemption, see http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm

Email Use: The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues

concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a students U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

Withdrawal from Class: The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures: Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the universitys Handbook of Operating Procedures.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance origi- nates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondents School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Deans decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the deal will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grade Policy: As per university policy, incomplete grades will be granted only for work unavoidably missed at the semesters end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F.

Disability Services: The goal of Disability Services is to provide students with disabilities educa- tional opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.

The contact information for the Office of Disability Services is:
The University of Texas at Dallas, SU 22
PO Box 830688
Richardson, Texas 75083-0688
(972) 883-2098 (voice or TTY)
disabilityservice@utdallas.edu

If you anticipate issues related to the format or requirements of this course, please meet with the Coordinator of Disability Services. The Coordinator is available to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with Disability Services to notify them of your eligibility for reasonable accommodations. Disability Services can then plan how best to coordinate your accommodations.

It is the students responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

Religious Holy Days: The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated. The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment. If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee. These descriptions and timelines are subject to change at the discretion of the Professor.