

Math 9133, Winter 2019
Real Analysis
Syllabus

Instructors: Rasul Shafikov, MC 112, shafikov@uwo.ca (emails will be answered within 48 hours).
Office hours: TBA.

Textbook: There is no required textbook for the course. Lecture notes for the material covered in class will be provided on a weekly basis.

Course web page: <http://shafikov.ca/rasul/teaching/winter2019/9133/>

Visit this page for up to date information on the course.

Course Coordinates: Course meets Tuesday 2 - 3:30 PM and Thursday 10:30 AM - 12 PM in MC 107.

Prerequisites: Multivariate Calculus, Linear Algebra, Metric Spaces.

Homework: Homework will be assigned biweekly and will include routine exercises as well as some challenging problems.

Presentations: At the end of the course each student is expected to give an oral presentation on the topic chosen by the student in consultation with the instructor. In addition a student will submit a 5-10 page writeup of the presentation, which will also be evaluated.

Evaluation: Homework = 50%, Presentation = 50%.

Content: We will cover the following topics

- (1) Functions of several variables: continuity, differentiability, Implicit/Inverse Function theorems, Rank theorem, higher order derivatives.
- (2) Integration: Riemann integral, Lebesgue integral (quick introduction), Fubini's theorem, basic L^p spaces, Hölder inequality, integrals depending on parameter.
- (3) Surface integrals: line and surface integrals, Divergence theorem, Green's formula, integration by parts, spherical coordinates, surface area, partition of unity.
- (4) Introduction to ODEs and PDEs: basic definitions, examples, existence results.
- (5) Distributions: test functions, basic properties of distributions, convolution, fundamental solutions of differential operators, Malgrange-Ehrenpreis theorem.

Senate Regulations on Scholastic Offences Please note the following points, which are required to be stated in this outline by the Senate regulations. Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: <http://www.uwo.ca/univsec/handbook/> . Specifically, the following document outlines scholastic discipline for graduate students:
http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_grad.pdf

Medical Accommodation For UWO Policy on Accommodation for Medical Illness see: Accommodation for Illness - Undergrads Downloadable Student Medical Certificate (SMC): under the Medical Documentation heading. Students seeking academic accommodation on medical grounds for any missed tests, exams, participation components and/or assignments worth 10% or more of their final grade must apply to the Academic Counselling office of their home Faculty and provide documentation. Academic accommodation cannot be granted by the instructor or department. Students who are in

emotional/mental distress should refer to Mental Health@Western for a complete list of options about how to obtain help, see <http://www.uwo.ca/uwocom/mentalhealth/>

Student Accessibility Services:

Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted to promoting, advocating, and accommodating persons with disabilities in their respective graduate program.

Graduate students with disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are encouraged to register with Student Accessibility Services, a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both SAS and their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that appropriate academic accommodations to program requirements are arranged. These accommodations include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.

For further details visit <http://www.sdc.uwo.ca/ssd/>