Principles of Real Analysis I - MA 3831

Instructor: Darko Volkov
darko@wpi.edu
~~Stratton Hall 104B~~ (<mark>I will not meet students in my office this term</mark>)

Class time: M, T, R, F: 2:00- 2:50, Stratton Hall 309
Conference: W, 2:00-2:50, Stratton Hall 309

<mark>**Special announcements in relation to the public health crisis**</mark>
<mark>Lectures will be captured on video and posted on the Canvas page for this course.</mark>

Office hours: M: 11:00 - 11:50
T: 12:00 - 12:50
R: 12:00 - 12:50
Additional times by appointment
<mark>Office hours will **NOT** take place in my office. Instead, students will receive an email a few minutes before the start of each office hour with a Zoom link. Students who want to ask me a question, or just attend the office hour can then log on.</mark>

Assistant: Dane Johnson, djohnson3@wpi.edu, will teach conferences and will hold office hours to provide help with homework problems or course material. He will also grade your homework papers and quizzes

Text: "Real Analysis and Applications", by K. R. Davidson and A. P. Donsig.
http://www.springer.com/mathematics/analysis/book/978-0-387-98097-3
All WPI students can download an on-line version of this textbook through Gordon Library.
We will use this edition, and not the newest edition available on paper only.
Other relevant textbook: Understanding Analysis, by Stephen Abbott, Springer.
This textbook is also available for free download as long as you have an active WPI account.

Course Description and Goals:

Principles of Real Analysis is a two-part course presenting a rigorous introduction to important concepts in classic real analysis. Topics covered in the two-course sequence include: basic set theory, the concept of real numbers, elementary topology of Euclidean spaces, limits and continuity, differentiation, Riemann

integration, infinite series, sequences of functions, applications to function approximation theory.

Here is an outline of the seven week progression for this MA 3831. Corresponding sections from the textbook are indicated.

Week 1	Real numbers, limits, supremum property: 2.1 to 2.7.
Week 2	$\mathbf{R}^n$: topology, convergence, compactness: 4.1 to 4.4.
Week 3	Functions and continuity: 5.1 to 5.3.
Week 4	Further properties of continuous functions: 5.4 to 5.7. Midterm.
Week 5	Differentiability and the mean value theorem: 6.1, 6.2.
Week 6	L'Hopital's rule. Convex functions.
Week 7	Riemann integration. 6.3.

Homework:

Homework will be due on Wednesdays. Assignments will be posted on the instructor's webpage,
http://users.wpi.edu/~darko/TEACHING/2021_2022/3831/frontpage.html
Your teaching assistant will be in charge of grading homework papers. Homework papers will be collected during conference.

Quizzes:

Expect a total of three to four quizzes throughout the term. Questions on quizzes will be based on homework problems, exercises, and examples covered in class. Quizzes will take place during conference.

Grade policy:

Midterm: 35%
Final: 35%
Homework: 20%
Quizzes: 10%

Academic honesty:

WPI students will be held to the highest ethical standards. Students should be familiar with the university's Academic Honesty Policy, to be found at
https://www.wpi.edu/about/policies/academic-integrity

Special Needs:

If you need course adaptations or accommodations because of a disability, or if you have medical information to share with me, please make an appointment with me as soon as possible. My office location and hours are listed at the top of this syllabus. Students with disabilities, who believe that they may need accommodations in this class should contact the Disability Services Office https://www.wpi.edu/student-experience/resources/disability-services as soon as possible to ensure that such accommodations are implemented in a timely fashion.