Detailed Syllabus for MATH 3220-003 Spring 2022
(preliminary version)
Foundation of Analysis II

This course will be delivered in In-Person mode.

Course Description:

Instructor: Dragan Miličić
Office: LCB 104
email: milicic@math.utah.edu
Place & time: LCB 225 MWF 4:35 pm – 5:55 pm
Office Hours: After the class or by appointment.
Textbook: Walter Rudin, Principles of Mathematical Analysis, Third Edition, MacGraw-Hill

Goals and Objectives: The main objective of this course is to learn rigorous foundation of calculus of functions of several variables, to learn how to do proofs and write them in mathematically precise form. We will assume that students are familiar with routine calculations done in regular calculus courses, so these will be deemphasized in the course.

Topics to be covered:
Since the honors version of Math 3210 was not taught in Fall term, we shall also review some topics usually covered there.

- Metric spaces, topological spaces, compactness, connectivity
- Spaces of continuous functions on compact spaces and their topology, Arzela-Ascoli theorem, Stone-Weierstrass theorem, application to Fourier series
- Differentiable maps on open sets in $\mathbb{R}^n$. Derivative, Chain rule, Inverse function theorem
- Integration of continuous functions on open sets in $\mathbb{R}^n$, Change of variables formula, Differential forms

Depending of time available and sutudent interest, we will discuss either Stokes theorem or introduction to measure theory.

Tests and Grading: Homeworks will be assigned on regular basis, but not collected or graded. Some interesting homework problems will be discussed in class after students worked on them. There will be three take-home midterm tests. They will be posted in Canvas in regular intervals. The problems on these tests will be of different degree of difficulty. They will require from students to write up detailed proofs of various statements related to the material covered in class. The students will have about two weeks to work on each take-home exam. I will ask students to present some of their solutions on the board in class. The grade will be based the scores on the midterms, presentations and discussions in class.