

# Math 415/515 Introductory Analysis III—Spring 2021

**Instructor:** Yefeng Shen

**Email:** yfshen@uoregon.edu

**Meeting times:** MWF: 12:30 pm-1:30 pm on Zoom.

**Virtual location:** Zoom ID: 5128548536, or Zoom link:

<https://uoregon.zoom.us/j/5128548536>

**Office Hours:** M 3pm-4pm, W 1:30pm-2:30pm, or Friday by appointment.

**Prerequisites:** Math 414/514 Introductory Analysis II.

**Materials/Text:** The lectures will mainly follow the books below:

- M. Spivak, Calculus on Manifolds.
- W. Rudin, Principles of Mathematical Analysis, chap 9, 10, (8 optional).

**Course Canvas site:** <https://canvas.uoregon.edu/courses/181299>

**Description and Goals:** This course introduces the subject of mathematical analysis. Topics include: functions of several variables, the inverse and implicit function theorems, higher order derivatives, integration on  $\mathbb{R}^n$ , Fubini's theorem, integration on manifolds, differential forms, and Stokes' theorem. The course, which is the last of three in the sequence, covers most of Spivak's textbook which corresponds to chapters 9 and 10 of Rudin. If time permits, we will cover chapter 8 of Rudin.

**Grading:** The grading distribution will be as follows:

- 35% on the homework.
- 25% on the mid term.
- 40% on final exam.

**Homework:** Homework problems will be assigned every week and be due in class on Wednesday on the material of the previous week.

- You shall upload the homework on Canvas.
- No late homework will be accepted.
- Your lowest homework score will be dropped.
- You may have group discussions on the homework, but you must individually write your assignment.

**Tentative weekly schedule:** Here are some topics that will be covered in each week.

1. Definition of Differentiation.
2. Inverse function Theorem, implicit function theorem.
3. Definition of Integration.
4. Fubini's Theorem.
5. More on integration, midterm.
6. Fields and forms on  $\mathbb{R}^n$ .
7. Stokes' Theorem. Definition of Manifolds.
8. Stokes' Theorem on manifolds.
9. Green's Theorem.
10. Special functions.

**Academic Conduct:** Students are prohibited from committing or attempting to commit any act that constitutes academic misconduct. You can find the Student Conduct Code in

<http://policies.uoregon.edu/content/z-index-uo-policy-statements>