

Syllabus for Analysis II

(CH07-100212 Analysis II)

Spring Semester 2018

Up-to-date course information can be found on the course website

http://math.jacobs-university.de/petrat/teaching/2018_spring_analysis2/index.html

1 Official Course Description

This course continues the introduction to mathematical analysis from the course “General Mathematics” and the course “Elements of Analysis” from the Jacobs Track “Methods Module”. This is a rigorous proof-based course. Topics include the Riemann-Stieltjes integral, curves in \mathbb{R}^n and differential equations, some basic topology, differentiation in \mathbb{R}^n , the implicit and inverse function theorem, and an introduction to the Riemann integral in \mathbb{R}^n .

2 Contact Information

Instructor: Prof. Sören Petrat
Email: s.petrat@jacobs-university.de
Office: Research I, room 112
TA: Steffen Maaß
TA Email: s.maass@jacobs-university.de

3 Time and Place

Mon 09:45 – 11:00, Lecture Hall Research I

Tue 14:15 – 15:30, Lecture Hall Research I

First class: February 5, 2018; last class: May 15, 2018

No classes on March 26, March 27, April 2 (Spring Break), and May 1 (Labor Day)

4 Textbooks

This class mainly follows

- W. Rudin - Principles of Mathematical Analysis (McGraw-Hill, third edition)
- T. Tao - Analysis I/II (Springer, third edition)

5 Exercises

Each week on Monday (except the first and exam weeks) there will be a homework assignment. These are an integral part of the coursework and working on the exercise sheets consistently is the best preparation for the exams.

- The solutions have to be handed in at the beginning of class.
- No late submissions are accepted.
- The two worst homework sheets are not considered for grading.
- It is encouraged to discuss the homework sheets with your classmates (e.g., discuss how to come up with the solution or what the right way of approaching the problem is). On the other hand, the solutions must be written down and handed in individually! Copying the solutions from somebody else is a violation of Academic Integrity.

6 Exams

There will be two exams, a midterm and a final. More details will be announced. Note that this class uses gradescope for grading exams, see <https://gradescope.com> for more information.

7 Grading

The final grade is weighted as follows:

Homework:	20%
Midterm:	30%
Final:	50%

8 Tentative Class Schedule

Session	Date	Topic
1	Feb 5	Riemann-Stieltjes Integral
2	Feb 6	Riemann-Stieltjes Integral
3	Feb 12	Riemann-Stieltjes Integral
4	Feb 13	Riemann-Stieltjes Integral
5	Feb 19	Convergence, Series, Sequences
6	Feb 20	Convergence, Series, Sequences
7	Feb 26	Convergence, Series, Sequences
8	Feb 27	Curves and Differential Equations
9	Mar 5	Curves and Differential Equations
10	Mar 6	Curves and Differential Equations
11	Mar 12	Curves and Differential Equations
12	Mar 13	Basic Topology
13	Mar 19	Basic Topology
14	Mar 20	Midterm
	Mar 26	Spring Break, no class
	Mar 27	Spring Break, no class
	Apr 2	Spring Break, no class
15	Apr 3	Differentiation in \mathbb{R}^n
16	Apr 9	Differentiation in \mathbb{R}^n
17	Apr 10	Differentiation in \mathbb{R}^n
18	Apr 16	Differentiation in \mathbb{R}^n
19	Apr 17	Differentiation in \mathbb{R}^n
20	Apr 23	Differentiation in \mathbb{R}^n
21	Apr 24	Differentiation in \mathbb{R}^n
22	Apr 30	Differentiation in \mathbb{R}^n
	May 1	Labor Day, no class
23	May 7	Riemann Integral in \mathbb{R}^n
24	May 8	Riemann Integral in \mathbb{R}^n
25	May 14	Riemann Integral in \mathbb{R}^n
26	May 15	Riemann Integral in \mathbb{R}^n
	TBA	Final Exam