

COURSE PLAN MAT4510 – GEOMETRIC STRUCTURES

Book

- Jähren, Bjørn, *Geometric Structures in Dimension two*

Teaching

The course consists of 26 lectures, out of which 5 are dedicated problem solving sessions. Please find the preliminary plan of the lectures below.

For each problem solving session there will be recommended exercises published on the course home page. You are strongly recommended to try to solve them before the problem solving session so that you can discuss your solutions with the other students during the lecture.

Examination

One mandatory assignment, which you have to pass to be able to show up for the final exam. Date for hand in is October 15.

The course ends with an **oral exam, November 24-25**. The main part will consist of a presentation of a subject related to the course. We will tell you what the subject is at least 10 days before the exam. The presentation should take 20 minutes.

You will then get some questions about your presentation, and then we finish the exam with some questions about the rest of the content of the course.

You can choose between having the exam at Blindern or at zoom.

THIS MIGHT CHANGE DUE TO CORONA! KEEP YOURSELF UPDATED!

Preliminary lecture plan

Lecture	Date	Content	Chapter
1 – 2	25/8, 28/8	Introduction and Hilbert's axiom system	1
3	1/9	Different models of the hyperbolic plane	2.1
4	4/9	Möbius transforms	2.2
PSS1	8/9	Problem solving session 1	1, 2.1 – 2.2
5 – 7	11/9, 15/9, 18/9	Real Möbius transforms	2.3 – 2.4, 2.7
8	22/9	\mathbb{H} and \mathbb{D} as a conformal models	2.5 – 2.7
9	25/9	Arc-length and area	2.8
10	29/9	Trigonometry in \mathbb{H}	2.9
PSS2	2/10	Problem solving session 2	2.3 – 2.7
11 – 12	6/10, 9/10	Surfaces and differential geometry	3, 5.1 – 5.2
13 – 14	13/10, 16/10	Geometry on surfaces	3, 4
15	20/10	Riemannian surfaces	5.3
PSS3	23/10	Problem solving session 3	2.8 – 2.9, 3, 5.1 – 5.2
16	27/10	Isometries and Curvature	5.4 – 5.5
17	30/10	Curvature continued	5.5
18	3/11	Geodesics	5.6
19	6/11	Geodesic polar coordinates. Riemannian surfaces of constant curvature	5.6 – 5.8
20	10/11	The Gauss-Bonnet theorem	5.9
PSS4	13/11	Problem solving session 4	5.1 – 5.9
21	17/11	Recap	
PSS5	20/11	Recap	