

Riemannian geometry, fall 2010

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Lecturer

[Ilkka Holopainen](#)

Scope

10 cu.

Type

Advanced studies

Prerequisites

Vector analysis, topology, linear algebra, some knowledge on smooth manifolds (like the course "[Johdatus differentiaaligeometriaan](#)") and on differential equations.

Lectures

Weeks 36-42 and 44-50, Tue 12-14, Thur 10-12 in room C123.

Exercise groups

Friday, 12-14 in room C124.

Exams

The course can be passed by an [exam](#). Extra credit from home work classes.

Content

- Differentiable manifolds (brief review)
- Riemannian metrics
- Connections
- Geodesics
- Curvature
- Jacobi fields
- Curvature and topology
- Comparison geometry
- The sphere theorem

Bibliography

- DoCarmo: Riemannian geometry, Birkhäuser, 1992
- Lee: Riemannian manifolds, An Introduction to Curvature, Springer, 1997

and (hand written) lecture notes: Holopainen: Differential Geometry (1999, 2001).

Lecture notes (first 101 pages, not proof-read): [RiemannGeo.pdf](#)

Registration

Did you forget to register? [What to do](#).

Home work assignments and solutions