# Mathematics Department
# University of Fribourg

**Course**
**MA 3218/3219 BSc**
**MA 4218/4219 MSc**

Friday 8-10 h
Room 0.101
Math II Lonza

**Level**

3rd year Bachelor
oder Master

**Course counts for**
**Algebra/Geometrie**

math.unifr.ch

## Course Academic year 2017/18

# Riemannian Geometry

## Dr. D. González Álvaro

### Contents

*Topics of this introductory lectures on Riemannian Geometry include:*

- *Smooth manifolds: tangent space, smooth maps (immersions and submersions)*
- *Riemannian manifolds: metrics and connections, geodesics and the exponential map, curvature notions, Jacobi fields*
- *Spaces with curvature bounds: constant, non-positive and non-negative curvature*
- *Further topics (time permitting): isometric Lie group actions, Riemannian submersions*

### Literature


- *do Carmo, M.: Riemannian geometry. Translated from the second Portuguese edition by Francis Flaherty. Mathematics: Theory Applications. Birkhauser Boston, Inc., Boston, MA, 1992*
- *Gallot, S.; Hulin, D.; Lafontaine, J.: Riemannian geometry. Third edition. Universitext. Springer-Verlag, Berlin, 2004*
- *Alexandrino, M.; Bettiol, R.: Lie groups and geometric aspects of isometric actions. Springer, Cham, 2015*
- *Cheeger, J.; Ebin, D.: Comparison theorems in Riemannian geometry. Revised reprint of the 1975 original. AMS Chelsea Publishing, Providence, RI, 2008*
- *Gromoll, D.; Walschap, G.: Metric foliations and curvature. Progress in Mathematics, 268. Birkhuser Verlag, Basel, 2009*


### Remarks

Die Vorlesung richtet sich an Studierende der Mathematik ab dem 3. Studienjahr.
Sie ist auch für Studierende der Physik und andere Interessierte mit guten Vorkenntnissen in Analysis und Linearer Algebra geeignet.

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