

F4B1-V3B3: Global Analysis I - Riemannian manifolds

Lecturer: Dr. B. Mesland

Content: This course will cover a review of manifolds, vector bundles, vector fields, differential forms, Stokes Theorem and related results (divergence theorem, Gauss' theorem). We will cover the basic notions of Riemannian geometry, such as metrics on vector bundles, connections and geodesics. Distance and curvature on a Riemannian manifold, submanifolds, the second fundamental form. We will then discuss the Gauss-Bonnet theorem and the relation between curvature and topology.

Recommended literature

We will use the book "Riemannian manifolds - an introduction to curvature" by John. M. Lee for the entire course. Lectures and exercises will be based on this book.

Prerequisites

Analysis on manifolds, real analysis, linear algebra, ordinary differential equations. Some knowledge of ring and module theory is useful but not required.