

MAT 1342/MAT464: Differential Geometry

Syllabus Winter 2009

Instructor: Frédéric Rochon email: rochon@math.toronto.edu
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Lectures: MWF 11am BA 2195 Office hour: Th10 or by appointment

Webpage: www.math.toronto.edu/rochon/MAT1342/

Textbook:

Riemannian Geometry, by S. Gallot, D. Hulin and J. Lafontaine

Course outline:

- Manifolds: definition, tangent bundle, vector fields, Lie groups, fibre bundles and homogeneous spaces,
- Riemannian metrics: definitions, connections, geodesics, the exponential map, Hopf-Rinow theorem,
- Curvature: definitions, fundamental identities, Riemannian submanifolds, variation of energy, Jacobi fields, spaces with constant curvature, relations between curvature and topology, Riemannian submersions and O'Neil's formula.

Prerequisites:

MAT363, Manifolds, differential forms, group theory, some algebraic topology (fundamental group).

Assignments

There will be an assignment due every two weeks or so. Each assignment will be announced in class and posted on the webpage.

Grade:

The final course grade will be based on the assignments and the final examination weighted as follows:

Assignments: 50 percent

Final examination: 50 percent