Faculty of Sciences

MATH2480 Differential geometry

[30h+15h exercises] 5 credits

This course is taught in the 1st semester

Teacher(s):   Yves Félix, Luc Haine, Pierre Van Moerbeke
Language: French
Level: Second cycle

Aims

The course presents the fundamental notions of differential geometry. It serves as a basis to other course of geometry in the masters' years of mathematical sciences.

Main themes

The course contains three parts:
1: A description of the basic objects of geometry: manifolds, fiber bundles, vector fields, differential forms, Lie bracket, differential of an application, immersion, submersion. Various examples: Lie groups, homogeneous spaces, projective spaces and Grassmannian manifolds.
2: A presentation of the basic elements of Riemann geometry: parallel transport, particular case of surfaces, curves, geodesics, etc.
3: Applications to mechanics and an overview of important theorems of geometry; Arnold-Liouville, tores geometry, Hamilton mechanics, etc.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Reference: Do Carmo M., Differentiable curves and surfaces, Prentice Hall, 1976.