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.

Other credits in programs

MAP21	Première année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(5 credits)	
MAP22	Deuxième année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(5 credits)	
MATH21/E	Première licence en sciences mathématiques (Economie mathématique)	(5 credits)	Mandatory
MATH21/G	Première licence en sciences mathématiques (Général)	(5 credits)	Mandatory
MATH21/S	Première licence en sciences mathématiques (Statistique)	(5 credits)	Mandatory