UE Differential geometry

Level
Baccalaureate +4

ECTS
6 credits

Component
UFR IM2AG (informatique, mathématiques et mathématiques appliquées)

Semester
Printemps

- **Teaching language(s):** French
- **Teaching method:** In person
- **Teaching type:** Lectures
- **Open to exchange students:** Yes
- **Code d'export Apogée:** GBMG8U13

Presentation

Description

Introduction to curves and surfaces.

Curves: Frénet references, covariant derivatives, reference fields, connection forms, structural equations.

Surfaces: surfaces of R^3, plane tangents, differential forms, differentiable applications between surfaces.

Abstract Variety: Whitney's Theorem

Curvature: Normal curvature, Gauss curvature, Geodesics. Case of surfaces of revolution.

Geometry of the surfaces of R^3: Egregium theorem, Gauss Bonnet's theorem

Possibility of complement: Transition to sub-varieties of ^{Rn} and abstract varieties

Possibility of complement: Introduction to dynamic systems. Vector fields and dynamic systems on varieties

Course parts

UE Differential and dynamic geometry - CM	Lectures (CM)	19,5h
UE Differential and dynamic geometry - TD	Tutorials (TD)	29h

Recommended prerequisites

Differential calculus of L3

Period : Semester 8

Bibliography

- Edmond Ramis, Claude Deschamps, Jacques Odoux, *Cours de mathe#matiques spe#ciales. 5. Applications de l'analyse a# la ge#ome#trie*, Masson, 1981
- Marcel Berger, Bernard Gostiaux, *Ge#ome#trie diffe#rentielle : varie#te#s, courbes et surfaces*, seconde e#dition, Presses Universitaires de France, 1992
- Manfredo Do Carmo, *Differential geometry of curves and surfaces*, Prentice-Hall, 1976
- Jacques Lafontaine, *Introduction aux variétés différentielles*, Grenoble Sciences, 2010

Useful info

Contacts

Program director

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Place

Grenoble

Campus

Grenoble - University campus