Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
MAT417	Differential Geometry	8	4	0	0	4	8

Prerequisites	MAT116, MAT202
Admission Requirements	MAT116, MAT202

Language of Instruction	French
Course Type	Compulsory
Course Level	Bachelor Degree
Objective	Introduction to fundamental theorems and concepts in differential geometry
Content	Curves, surfaces, differential forms, first fundamental form, second fundamental form, Christoffel symbols, geodesics, Gauss's theorema egregium theorem, Gauss-Bonnet theorem, differentiable manifolds, tangent bundle, Lie derivative, Lie brackets, Lie groups, de Rham cohomology
References	Cours de mathématiques pures et appliquées : Algèbre et géométrie - Ramis, Warusfel, Moulin Géométrie et calcul différentiel sur les variétés - Pham Differential geometry of curves and surfaces - Do Carmo Géométrie différentielle élémentaire - Paulin Notes de cours de Géométrie différentielle - Oancea Géométrie différentielle - Guedj Lectures on the Geometric Anatomy of Theoretical Physics - Schuller

Theory Topics

Week	Weekly Contents
1	Differential calculus
2	Differential forms
3	Curves
4	Surfaces
5	Tensors, quizz
6	First fundamental form
7	Second fundamental form
8	Midterm
9	Submanifold
10	Manifold
11	Tangent bundle
12	Lie brackets, Lie derivative
13	Lie group
14	de Rham Cohomology, quizz