

## Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
MAT417	Differential Geometry	8	5	3	0	3	5

Prerequisites	MAT116, MAT202
Admission Requirements	MAT116, MAT202

Language of Instruction	
Course Type	Elective
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	<p>Cours de mathématiques pures et appliquées : Algèbre et géométrie - Ramis, Warusfel, Moulin</p> <p>Géométrie et calcul différentiel sur les variétés - Pham</p> <p>Differential geometry of curves and surfaces - Do Carmo</p> <p>Géométrie différentielle élémentaire - Paulin</p> <p>Notes de cours de Géométrie différentielle - Oancea</p> <p>Géométrie différentielle - Guedj</p> <p>Lectures on the Geometric Anatomy of Theoretical Physics - Schuller</p>

## 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