

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	This course aims to give an introduction to the basic concepts of Differential Geometry, Differential Topology.
Content	Smooth manifolds, Smooth maps, The tangent space, The cotangent bundle, Submanifolds, Embedding and Approximation theorems, Lie group actions, Tensors, Differential forms, Integration on manifolds, De Rham cohomology, Stokes theorem.
References	Principe d'analyse mathématique", W. Rudin "Géométrie et calcul différentiel sur les variétés : Cours, études et exercices pour la maîtrise de mathématiques», F.Pham "Géométrie et Topologie des Surfaces" D. Lehmann, C.Sacre

Theory Topics

Week	Weekly Contents
1	experience 1 Jacobians
2	Experience 2 Local inversion
3	Experience 3 Implicit function theorem
4	experience 4 Implicit function theorem
5	Subvariety
6	Smooth subvariety
7	Midterm
8	Tangent space
9	Directional derivative
10	Integration on manifolds
11	Differential forms
12	Polar coordinates
13	Stokes theorem
14	Closed Exact forms