UCLouvain

lmat1342

2020

Geometry 3

Due to the COVID-19 crisis, the information below is subject to change, in particular that concerning the teaching mode (presential, distance or in a comodal or hybrid format).

5 credits	30.0 h + 30.0 h	Q1

Teacher(s)	Haine Luc ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	*The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.*
Aims	*The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Take home final written exam (3 hours, 10 points) testing the understanding of the theory and the ability to solve problems. The other part of the final note (10 points) will be based on a continuous evaluation during the quadrimester. This part will be taken into account at each session and it will not be possible to retake it.
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Learning activities consist of lectures which aim to introduce fundamental concepts, to explain them by showing examples and establishing results. During each problem sesssion, students will be assigned exercises that they must prepare beforehand. These presentations count for the final note of the examinantion.
Content	In 2020-2021, the course will address the basic notions of differential geometry. 1. Submanifolds of euclidean space, abstract varieties. 2. Tangent space, tangent bundle and vector fields. 3. Differential forms and Stokes-Cartan theorem. 4. Elements of Riemannian geometry. The aim of the course will be to master the techniques of differential calculus on manifolds (tangent space, differential forms, connections, tensors) as it is applied in modern physical theories (for instance general relativity).
Inline resources	The syllabus of the course in French "Introduction à la géométrie différentielle" can be obtained via "Diffusion Universitaire Ciaco", Louvain-la-Neuve. The syllabus also contains the statements of the exercises to be performed during the problem sessions.
Bibliography	M. Berger et R. Gostiaux, Géométrie différentielle: variétés, courbes et surfaces, P.U.F. Paris 1992. S.S. Chern, W.H. Chen, K.S. Lam, Lectures on differential geometry, Series on University Mathematics - Vol. 1, World Scientific 2000.
Faculty or entity in charge	MATH

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Additionnal module in Mathematics	APPMATH	5		
Bachelor in Mathematics	MATH1BA	5	LMAT1141 AND LMAT1241	
Minor in Mathematics	MINMATH	5		