Università degli Studi di L'Aquila - Dipartimento di Ingegneria e Scienze dell'Informazione e Matematica

Course catalogue

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Programme of Course "Riemannian Geometry"

- Code: DT0248
- Type of course unit: Elective (Master Degree in Mathematics curriculum Generale)
- Level of course unit: Postgraduate Degrees
- Semester: 2

Number of ects credits: (Master Degree in Mathematics) 6 (workload 150 hours)

Teachers: Barbara Nelli, Giuseppe Pipoli (giuseppe.pipoli@univaq.it)

1	**Course objectives**	The objective of this course is to get the student familiar with basic notions and some fundamental results of Riemannian Geometry . At the end of the course the student should be able to solve by her/him-self some simple, but new problems regarding all the program.
2	**Course content and learning outcomes (dublin descriptors)**	Topics of the module include: • Differentiable manifolds • Riemannian Metrics • Affine and Riemannian connections • Geodesics, curvatures • Jacobi Fields • Isometric Immersions • Complete manifolds: Hopf and Hadamard theorems • Constan curvature spaces • Variations of energy On successful completion of this module, the student should : 1. Know the basic notions and the fundamental results of Riemannian geometry 2. Be able to solve simple problems regarding the program. 3. Be able to select which problems they can discuss and understand with the notions they have. 4. Organize the notions they have acquired with different points of view, to get new (even if not original) results.
3	**Course prerequisites**	Analysis of one and many variables, linear algebra, geometry of curves and surfaces, basic topology.
4	**Teaching methodsand language**	The course will be given at the blackboard by the teacher. Each theoretic part will be followed by some exercises. **Language**: English **Reference textbooks** • M.P. Do Carmo, ***Riemannian Geometry***. Birkhauser. 1992. • P. Petersen, ***Riemannian Geometry***. Springer 2016.
5	**Assessment methods**	Written and Oral