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

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Programme of Course "Meccanica Razionale"	
- Code: F0503 - Type of course unit: Compulsory (Bachelor Degree in Mathematics curriculum Generale) - Level of course unit: Undergraduate Degrees - Semester: 2	
Number of ects credits: (Bachelor Degree in Mathematics) 9 (workload 225 hours)	
Teachers: Immacolata Merola (immacolata.merola@univaq.it)	

1	**Course objectives**	This course aims to enable the students to understand Classical and Analytical Mechanics and to handle the most important related mathematical tools.
2	**Course content and learning outcomes (dublin descriptors)**	Topics of the module include: - Principles and mathematical formulation. - One-dimensional systems. - Motion under central forces. - N-points systems. - Constrained systems. - Lagrange equations. - Hamiltonian systems. - Canonical transformations. - Small oscillations of Lagrangian systems. - Variational principles. - More about hamiltonian systems. On successful completion of this module, the student should : - have acquired the basic notions of Classical and Analytical Mechanics, - be able to handle the related mathematical tools, - have acquired the ability of reading and understanding more advanced topics in Mechanics, - be able to face subsequent topics in Physics as Quantum and Statistical Mechanics, - be able to recognize when the acquired notions are useful for the comprehension of other topics, - be able to face novel problems with a similar mathematical modeling.
3	**Course prerequisites**	Differential Equations, Elementary Linear Algebra.
4	**Teaching methodsand language**	Lectures and exercises. **Language**: Italian **Reference textbooks** A. Celletti, *Esercizi e complementi di Meccanica Razionale*. Aracne. 2003. R. Esposito, *Appunti dalle lezioni di Meccanica Razionale*. Aracne. 1998. *http://univaq.it/~serva/teaching/teaching.html* A. Teta, *Appunti di Meccanica Razionale*. *http://univaq.it/~serva/teaching/teaching.html* E. Olivieri, *Appunti di Meccanica Razionale*. UniTor. 1990. V. I. Arnold, *Mathematical Methods of Classical Mechanics*. Springer-Verlag. 1989. L. Benfatto, R. Raimondi, E. Scoppola, *Meccanica Hamiltoniana*. 2006-2007. *http://univaq.it/~serva/teaching/teaching.html*
5	**Assessment methods**	Written and, if necessary, oral examination.