UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

DIPARTIMENTO INTERUNIVERSITARIO DI FISICA

General information	
Academic subject	Meccanica Analitica
Degree course	Fisica
Academic Year	2
European Credit Transfer and Accumulation System (ECTS)	8
Language	Italian
Academic calendar (starting and ending date)	First week of March - Last week of May
Attendance	

Professor/ Lecturer	
Name and Surname	Antonio Marrone
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Department and address	
Virtual headquarters (Microsoft Teams code)	
Tutoring (time and day)	On request

Syllabus	
Learning Objectives	Understanding lagrangian and Hamiltonian mechanics
Course prerequisites	General Physics
Contents	1) Equations of motion, Generalized coordinates, Principle of minimum action, Principle of relativity of Galilei, Lagrange function of a free material point, Lagrange function of a system of material points 2) Conservation laws, Energy, Momentum, Centre of mass, Momentum, Mechanical similitude 3) Integration of equations of motion, One-dimensional motion, Reduced mass, Motion in a central field, Kepler problem 4) Particle collisions, Particle disintegration, Elastic particle shocks, Particle diffusion, Rutherford formula 5) Small oscillations, Free unidimensional oscillations, Forced oscillations, Oscillations of systems with multiple degrees of freedom, Damped oscillations, Forced oscillations in the presence of friction, Anarmonic oscillations. 6) Rigid bodies 7) Canonical equations
Books and bibliography	L.D. Landau e E.M. Lifšits, Fisica Teorica I, Meccanica, Editori Riuniti
Additional materials	Notes from the teacher

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
	78		120
ECTS			
	8		

Teaching strategy	
	Lessons on the blackboard

Expected learning outcomes	
Knowledge and understanding on:	Understanding lagrangian and Hamiltonian mechanics
Applying knowledge and understanding on:	Application of lagrangian and Hamiltonian mechanics
Soft skills	• **Making informed judgments and choices** Ability to proceed autonomously in the study of lagrangian and hamiltonian systems • **Communicating knowledge and understanding** Ability to express the acquired knowledge properly

	• **Capacities to continue learning** Ability to study independently from texts and scientific literature

Assessment and feedback	
Methods of assessment	Written and oral test
Evaluation criteria	Adequate comprehension and global knowledge of concepts and arguments described throughout the course.
Criteria for assessment and attribution of the final mark	
Additional information	