

LEARNING MODULE DESCRIPTION

GENERAL INFORMATION

1. Module title: Classical Mechanics
2. USOS code: 04-S1FZ03-P03290
3. Term: Winter
4. Duration: 45 (30lectures+15 classes)
5. ECTS: 5.0
6. Module lecturer: Przemyslaw Chelminiak
7. E-mail: geronimo@amu.edu.pl
8. Language: English

DETAILED INFORMATION

1. Module aim (aims)
Transfer of knowledge in the field of basic theoretical methods used in research of classical systems such as differential equations, variational calculus, analitical geometry, etc.
Development of skills concerning the analysis and solution of problems related to classical mechanics.
2. Pre-requisites in terms of knowledge, skills and social competences (where relevant):
calculus (differentiation, integration), vector algebra.

READING LIST

R. D. Gregory, Classical Mechanics, Cambridge University Press (2006).
H. Goldstein, C. Poole, J. Safko, Classical Mechanics, Addison Wesley (2001).
W. Greiner. Classical Mechanics, Springer (2010).

SYLLABUS:

Week 1: Newtonian particle mechanics
Week 2: Relativity
Week 3: Variational principle
Week 4: Lagrangian mechanics
Week 5: Hamiltonian mechanics
Week 6: Constraints and symmetries
Week 7: Central forces and two-body problem (planetary motion)
Week 8: Elements of rigid-body dynamics
Week 9: Harmonic oscillators and coupled oscillators (Chirikov map)
Week 10: Complex systems: conservative chaos, dissipative chaos, the logistic map.