

Module title		Abbreviation
Theoretical Physics 1 and 2 for Pre Service Teachers - Fundamentals		11-L-T12-152-m01
Module coordinator		Module offered by
Managing Director of the Institute of Theoretical Physics and Astrophysics		Faculty of Physics and Astronomy
ECTS	Method of grading	Only after succ. compl. of module(s)
4	numerical grade	--
Duration	Module level	Other prerequisites
2 semester	undergraduate	--
Contents		
<p>Basic physical laws and elementary methods of theoretical physics.</p> <p>Mechanics: Newton's laws Physical quantities and conservation laws, systems of mass points, reference systems, dimensional motion, Lagrange equations, applications, Hamiltonian dynamics.</p> <p>Quantum Mechanics: Schrödinger equation, one-dimensional quantum mechanics, quantum mechanics Abstract (operator formalism), angular momentum, spin.</p> <p>Electrodynamics: Maxwell equations, electrostatics, magnetostatics, dynamic electromagnetic fields, Special Theory of Relativity.</p> <p>Thermodynamics: Heat, entropy, thermal equilibrium, measured variables, efficiency, Thermodynamic potentials, phase transitions.</p>		
Intended learning outcomes		
The students know the basic principles, contexts and elementary methods of Theoretical Physics, theoretical mechanics, quantum mechanics, thermodynamics, electrodynamics and Statistical Physics. They are able to discuss the acquired theoretical concepts and to attribute them to bigger physical contexts.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (4) + V (4) Module taught in: Ü: German or English		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
oral examination of one candidate each (approx. 30 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
120 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 77 I Nr. 1 c)		
Module appears in		
First state examination for the teaching degree Gymnasium Physics (2015)		