## Module title
Theoretical Physics 1 and 2 for Pre Service Teachers - Fundamentals

### Abbreviation
11-L-T12-152-m01

## Module coordinator
Managing Director of the Institute of Theoretical Physics and Astrophysics

## Module offered by
Faculty of Physics and Astronomy

## ECTS
4

## Method of grading
Only after succ. compl. of module(s)

## Duration
2 semester

## Module level
undergraduate

## Other prerequisites
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## Contents
Basic physical laws and elementary methods of theoretical physics.
Mechanics: Newton’s laws, Physical quantities and conservation laws, systems of mass points, reference systems, dimensional motion, Lagrange equations, applications, Hamiltonian dynamics.
Quantum Mechanics: Schrödinger equation, one-dimensional quantum mechanics, quantum mechanics Abstract (operator formalism), angular momentum, spin.
Electrodynamics: Maxwell equations, electrostatics, magnetostatics, dynamic electromagnetic fields, Special Theory of Relativity.
Thermodynamics: Heat, entropy, thermal equilibrium, measured variables, efficiency, Thermodynamic potentials, phase transitions.

## 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
(V (4) + V (4))
Module taught in: Ü: German or English

## Method of assessment
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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## 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)