### Module title

**Theoretical Physics 1 for Pre Service Teachers**  
11-L-T1-172-m01

### Module coordinator

Managing Director of the Institute of Theoretical Physics and Astrophysics

### Module offered by

Managing Director of the Institute of Theoretical Physics and Astrophysics

### ECTS

7

### Method of grading

Numerical grade

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

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### Duration

1 semester

### Module level

Unknown

### Other prerequisites

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### Contents

Basic physical laws and elementary methods of theoretical physics.  
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

Students have an understanding of the fundamental laws of the interrelationships and elementary methods of theoretical physics from the theoretical mechanics, quantum mechanics, thermodynamics, electrodynamics and statistical physics. They can use the acquired theoretical concepts and fit into larger physical context and discuss.

### Courses

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<th>Type</th>
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<td>V</td>
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### Module taught in

Ü: German or English

### Method of assessment

Written examination (approx. 120 minutes)  
Language of assessment: German and/or English  
Creditable for bonus

### Allocation of places

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### Additional information

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### Referred to in LPO I (examination regulations for teaching-degree programmes)

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### Module appears in

First state examination for the teaching degree Gymnasium Physics (2018)

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JMU Würzburg • generated 17.09.2019 • Module data record 126115