

Module title		Abbreviation
Theoretical Physics 1 for Pre Service Teachers		11-L-T1-161-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)
7	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: completion of exercises (approx. 13 exercise sheets per semester). Students who successfully completed approx. 50% of exercises will qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the semester.
Contents		
<p>Physical laws and elementary methods of Theoretical Physics. Mechanics: Newton's laws, physical values and conservation laws, systems of mass points, reference systems, one-dimensional motion, Lagrange equations, applications, Hamiltonian dynamics.</p> <p>Quantum mechanics: Schrödinger equation, one-dimensional quantum mechanics, abstract quantum mechanics (operator formalism), angular momentum, spin.</p> <p>Electrodynamics: Maxwell equations, electrostatics, magnetostatics, dynamics of electromagnetic fields, special relativity.</p> <p>Thermodynamics: Heat, entropy, thermal equilibrium, measurands, level of 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) + Ü (2) 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)		
written examination (approx. 120 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
Registration: If a student registers for the exercises or the seminar and obtains the qualification for admission to assessment, this will be considered a declaration of will to seek admission to assessment pursuant to Section 20 Subsection 3 Sentence 4 ASPO (general academic and examination regulations). If the module coordinators subsequently find that the student has obtained the qualification for admission to assessment, they will put the student's registration for assessment into effect. Only those students that meet the respective prerequisites can successfully register for an assessment. Students who did not register for an assessment or whose registration for an assessment was not put into effect will not be admitted to the respective assessment. If a student takes an assessment to which he/she has not been admitted, the grade achieved in this assessment will not be considered.		
Workload		
210 h		

**Teaching cycle**

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

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**Module appears in**

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)

Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)