### Module title
Theoretical Elementary Particle Physics

### Abbreviation
11-TEP-Int-201-m01

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

### Module offered by
Faculty of Physics and Astronomy

### ECTS
8

### Method of grading
numerical grade

### Only after succ. compl. of module(s)
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### Duration
1 semester

### Module level
graduate

### Other prerequisites
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### Contents
1. Fundamental Forces and Particles  
2. Groups and Symmetries  
3. Quark Model of Hadrons  
4. Parton Model and Deep Inelastic Scattering  
5. Basics of Quantum Field Theory  
6. Gauge Theories  
7. Spontaneous Symmetry Breaking  
8. Electro-Weak Standard Model  
9. Quantum Chromo Dynamics  
10. Extensions of the Standard Model

### Intended learning outcomes
Familiarity with the mathematical methods of elementary particle physics. Understanding of the structure of the standard model and its construction from symmetry principles and experimental observations. Knowledge of the calculational methods for scattering and decay processes, tests of the standard models and there are limitations. Familiarity with the basics of extended theories.

### Courses
(type, number of weekly contact hours, language — if other than German)

V (4) + R (2)

Module taught in: 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)

a) written examination (approx. 90 to 120 minutes) or  
b) oral examination of one candidate each (approx. 30 minutes) or  
c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or  
d) project report (approx. 8 to 10 pages) or  
e) presentation/talk (approx. 30 minutes).

If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.

Language of assessment: English

Assessment offered: In the semester in which the course is offered and in the subsequent semester

### Allocation of places
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### Additional information
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<tr>
<th><strong>Referred to in LPO I</strong></th>
<th>(examination regulations for teaching-degree programmes)</th>
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