## Module Description

### Module Title
Computational Physics

### Abbreviation
11-CP-152-m01

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

### Module Offered by
Faculty of Physics and Astronomy

### ECTS
6

### Method of Grading
Numerical grade

### Only after Succ. Compl. of Module(s)
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### Duration
1 semester

### Module Level
Undergraduate

### Other Prerequisites
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### Contents
- Introduction to programming on the basis of C++ / Java /Mathematica
- Numerical solution of differential equations
- Simulation of chaotic systems
- Generation of random numbers
- Random walk
- Many-particle processes and reaction-diffusion model

### Intended Learning Outcomes
The students have knowledge of two major programming languages and know algorithms important for Physics. They have knowledge of numerical standard methods and are able to apply computer-assisted processes to the solution of physical problems, e.g. algorithms for solving numerical problems of Physics.

### Courses
V (3) + R (1)

### Module Taught in: German or English

### Method of Assessment
- Written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or 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.
- Assessment offered: Once a year, winter semester
- 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)
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### Module Appears In
- Bachelor's degree (1 major) Physics (2015)
- Bachelor's degree (1 major) Mathematical Physics (2015)
- Bachelor's degree (1 major, 1 minor) Physics (Minor, 2015)
- Bachelor's degree (1 major) Mathematical Physics (2016)
- Bachelor's degree (1 major) Physics (2020)
- Bachelor's degree (1 major) Mathematical Physics (2020)
- Bachelor's degree (1 major, 1 minor) Physics (Minor, 2020)