### Module title

**Computational Physics**

### Abbreviation

11-A1-092-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

Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

### 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

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

V + Ü (no information on SWS (weekly contact hours) and course language available)

### 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)

Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009.

### Allocation of places

Only as part of pool of general key skills (ASQ): 15 places. Places will be allocated by lot.

### 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' degree (1 major) Physics (2010)

Bachelor' degree (1 major) Physics (2012)

Bachelor' degree (1 major) Nanostructure Technology (2010)

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<th>Bachelor's degree (1 major) Mathematical Physics (2009)</th>
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<tr>
<td>Bachelor's degree (1 major, 1 minor) Physics (Minor, 2010)</td>
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