## Computational Physics (T) - physics760

**Degree** - M.Sc. in Physics (PO von 2014)

| ***Module*** | **Elective Courses Theoretical Physics** |
|---|---|
| *Module No.* | ECThPhysics |

| ***Course*** | **Computational Physics (T)** |
|---|---|
| *Course No.* | physics760 |

| **Category** | **Type** | **Language** | **Teaching hours** | **CP** | **Semester** |
|---|---|---|---|---|---|
| Elective | Lecture with exercises and project work | English | 2+2+1 | 7 | WT/ST |

**Requirements for Participation:** Knowledge of a modern programming language (like C, C++)

**Preparation:** Theoretical courses at the Bachelor degree level

**Form of Testing and Examination:**

successful participation in exercises,

presentation of an independently completed project

**Length of Course:** 1 semester

**Aims of the Course:** ability to apply modern computational methods for solving physics problems

**Contents of the Course:**

Statistical Models, Likelihood, Bayesian and Bootstrap Methods

Random Variable Generation

Stochastic Processes

Monte-Carlo methods

Markov-Chain Monte-Carlo

**Recommended Literature:**

W.H. Press et al.: Numerical Recipes in C (Cambridge University Press)

http://library.lanl.gov/numerical/index.html

C.P. Robert and G. Casella: Monte Carlo Statistical Methods (Springer 2004)

Tao Pang: An Introduction to Computational Physics (Cambridge University Press)

Vesely, Franz J.: Computational Physics: An Introduction (Springer)

Binder, Kurt and Heermann, Dieter W.: Monte Carlo Simulation in Statistical Physics (Springer)

Fehske, H.; Schneider, R.; Weisse, A.: Computational Many-Particle Physics (Springer)