**Modules:**

ECThPhysics **Elective Courses Theoretical Physics**
physics70c **Elective Advanced Lectures: Theoretical Physics**

# 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)