

**Modules:**

physics700 **Elective Advanced Lectures**  
 physics730 **Theoretical Physics**

**Course:**

## Computational Methods in Condensed Matter Theory (T)

**Course No.:** physics767

Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture with exercises	English	3+2	7	WT/ST

**Requirements:****Preparation:**

Quantum Field Theory (physics755)  
 Advanced Theoretical Physics (physics607) / Advanced Quantum Field Theory (physics7501)  
 Advanced Theoretical Condensed Matter Physics (physics638)

**Form of Testing and Examination:**

Active participation in exercises, written examination

**Length of Course:**

1 semester

**Aims of the Course:**

Detailed discussion of computational tools in modern condensed matter theory

**Contents of the Course:**

Exact Diagonalization (ED)  
 Quantum Monte Carlo (QMC)  
 (Stochastic) Series expansion (SSE)  
 Density Matrix Renormalization (DMRG)  
 Dynamical Mean Field theory (DMFT)

**Recommended Literature:**

will be given in the lecture