Humboldt–Universität zu Berlin
Institut für Physik

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https://top.physik.hu-berlin.de/teaching

SoSe 2018

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Computational Photonics: Information Sheet

1 The lecture is accompanied by weekly exercises, split into two parts. In the one part, the solution of the problem sets is presented, in the other part further problems closely related to the lecture will be discussed. The tutorial session will take place on Fridays 9 to 11 am in room NEW 14 1'14. The tutorials start on April 27th. There will be an optional Matlab introduction on Friday 20th in the computing lab ("Poolraum") NEW 15 1'427.

2 The problem sets will be handed out in class and can also be downloaded from our website **https://top.physik.hu-berlin.de/teaching**. They shall be solved independently and will be discussed in the exercise classes. Successful participation in the lectures is the condition to obtain the ECTS points for this class. Therefore, the Matlab code is due on the day of the exercise class before 8 am via e-mail to **bettina.beverungen@physik.hu-berlin.de** or as a digital copy via USB stick. To obtain these ECTS points at least 50% of the problems excluding voluntary problems (marked with *) must be solved with serious effort and independently.

3 Parts of the problem sets have to be solved with the computer. As software we use Matlab. Matlab is installed on the computers in the computing lab ("Poolraum") of the physics building. Information including the hours can be found at **https://poolinfo.physik.hu-berlin.de**. A Matlab license for students is not available. Most of the problems can be solved with GNU Octave which is open software available online at **https://www.gnu.org/software/octave**.

Information material on Matlab can be found on the official web pages of the software. But there are also various web pages that provide helpful introductory material to the software. On our homepage you can find some useful links.

4 The course is not following a specific textbook. For orientation, we provide a (necessarily incomplete) list of textbooks. There are many more textbooks that deal with the various numerical methods in photonics.

- K. Okamoto, Beam Propagation Method (chapter 7 of Fundamentals of Optical Waveguides), Elsevier Science & Technology, Amsterdam, 2006
- B. Lee, Fourier modal method and its applications in computational nanophotonics CRC Press, Boca Raton, 2010
- U. Inan and R. Marshall, Numerical Electrodynamics: The FDTD Method, Cambridge University Press, Cambridge, 2011