



Computational Photonics (SoSe 2021): Information Sheet

Lecturer: Prof. Dr. Kurt Busch
Tutor: Thomas Kiel

1 Moodle

The course is organized via Moodle. So please register to this course on HU-Moodle¹. Via Moodle you will get all necessary material, information and links to HU-Zoom².

2 Lecture

The lecture will take place on Thursdays from 9 to 11, beginning on April 15, via Zoom.

3 Tutorial

The lecture is accompanied by a bi-weekly tutorial. It will take place on Fridays from 9 to 11, via Zoom. The first tutorial takes place on Friday, April 30. There will be bi-weekly exercise sheets, which shall be solved independently and submitted via Moodle. We prefer pdf files but photos/scans of handwritten documents are also accepted. To obtain the ECTS points for the exercise at least 50% of the exercises must be solved with serious effort and independently. The solution will be presented in the tutorial. We can also use the tutorial to discuss further questions related to the lecture.

4 Software

Parts of the exercises have to be solved with the computer. We use Matlab, which is installed on the computers in the computer room³ of the department of physics. For

¹<https://moodle.hu-berlin.de/course/view.php?id=94431>

²<https://hu-berlin.zoom.us>

³<https://www.physics.hu-berlin.de/en/computing-centre/pc-pool>

students of the HU, there is a Matlab campus license⁴. Don't hesitate to ask us if you have problems to obtain Matlab. Information material on Matlab can be found on the official web pages of the software. Most of the problems can be solved with GNU Octave⁵ which is available as open source software. Furthermore, you are welcome to solve the problems with Python together with packages such as numpy and matplotlib. You can find information on scientific computing with python on SciPy⁶. Besides the standard OS packages, there is also an easy way of obtaining all necessary packages which is offered by the Python distribution Anaconda⁷. If wished, a hands-on tutorial for a basic introduction on how to use Matlab or Python may also be offered for the April 23 session.

5 Literature

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 Wave-guides), 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

6 Note with regards to COVID-19

Due to the ongoing pandemic situation, the lecture and exercises of the Computational Photonics course will be conducted electronically in the form of synchronous video conferences. Therefore, when you have registered to the Moodle course of Computational Photonics, you will receive via Email invitations to the corresponding Zoom-meetings.

⁴<https://hu-berlin.de/matlab> (access via VPN)

⁵<https://www.gnu.org/software/octave>

⁶<https://scipy.org>

⁷<https://www.anaconda.com>