

UMCS
Nanophotonics II
Winter 2019/2020

Instructor Information:

Instructor: Dr Nicholas Sedlmayr

Office: 306

Email: sedlmayr@umcs.pl

Course Web Page: See [this](#) page.

Course Content: The topics of this course will be:

- Part I:
 - Introduction to light's interaction with matter
 - Derivation of Wave Equation in matter from Maxwell's equations
 - Dielectric properties of insulators, semiconductors and metals (bulk)
 - Light interaction with nanostructures and microstructures (compared with λ)
- Part II:
 - Photonic Crystals
 - Electromagnetic effects in periodic media
 - Light localization, photonic crystal fibers
- Part III:
 - Metal optics (plasmonics) and nanophotonics
 - Light interaction with 0, 1, and 2 dimensional metallic nanostructures Guiding and focusing light to nanoscale
 - Transmission through subwavelength apertures
- Part IV: Metamaterials

Grading: The course grade will be based on participation in the classes and a final oral exam.

Objectives: To have an overview of the different advances in nanophotonics and their applications.

Prerequisites: Basic electromagnetism (Maxwell's equations), calculus.