

Course Syllabus

Class time: M5M6W6 Location: Delta 212

Instructor: Chen-Bin Huang (robin@ee.nthu.edu.tw) Delta 859 Tel: 62180

Feel free to arrange office hour with me via e-mail.

TA: 林忠穎 (freewing0411@gmail.com) EECS 312 Ext. 34927

Course Description:

The intent of this course is to allow broad and general understandings toward the fundamentals of nanophotonics, material preparations and characterizations in nanophotonics. Three areas will then be discussed in depth: photonic crystals, plasmonics, and metamaterials.

In this graduate-level course, I would like to create a vibrant discussion atmosphere. Let's embrace the *flip-learning* concept: you read through the designated materials before coming to class. Then in the classroom, we focus on your specific questions. Therefore, *active participation and the ability to present your knowledge are heavily expected.*

Recommended background knowledge: Electromagnetics, Introduction to Optoelectronics I, Photonics I.

References:

General:

L. Novotny and B. Hecht, *Principles of Nano-Optics*, 2nd Ed., Cambridge University Press, 2012.

S. V. Gaponenko, *Introduction to Nanophotonics*, Cambridge University Press, 2010.

Photonic Crystal:

J. D. Joannopoulos et.al., *Photonics Crystals: molding the flow of light*, 2nd Ed., Princeton, 2008.

Plasmonics:

S. A. Maier, *Plasmonics: fundamentals and applications*, Springer, 2007.

M. L. Brongersma and P. G. Kik, *Surface Plasmon Nanophotonics*, Springer, 2007.

Metamaterials:

W. Cai and V. M. Shalaev, *Optical Metamaterials*, Springer, 2010.

Recent journal publications

Class notes: Course materials available on <http://lms.nthu.edu.tw>

Teaching Method:

Lectures in English, discussions in English/Chinese.

Course Content:

- Introduction and foundations for nanophotonics
- Photonic crystals
- Near-field optics
- Plasmonics
- Metamaterials
- [Student lectures](#)

Grading Policy:

Discussion and involvement (20%)

Homework (25%)

Midterm examination (25%)

Project/lecture (30%)