

Course Syllabus

Class time: M5M6R4 Location: Delta 210

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: EECS 312 Ext. 34927

Course Description:

The intent of this course is to allow broad and general understandings toward the fundamentals of 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.

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.

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/presentation (30%)