

## Course Syllabus

Class time: T7T8R7                      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: Tony      dhruvtyagi.st@gmail.com                      EECS 311    Ext. 34926

### 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*, 2<sup>nd</sup> Ed., Cambridge University Press, 2012.

#### **Photonic Crystal:**

J. D. Joannopoulos et.al., *Photonics Crystals: molding the flow of light*, 2<sup>nd</sup> 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%)