National Tsing Hua University

10810 IPT 518000 Nanophotonics

Course Syllabus

Class time: M7M8R7 Location: Delta 211

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: Jamie Chen a54854854@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 dicsussed 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 knowledege: 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.

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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

Grading Policy:

Discussion and involvement (25%)

Homework (25%)

Midterm examination (25%)

Final examination (25%)