

Course Syllabus

Class time: M5M6W2 Location: Delta Room 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 full understandings towards the fundamentals of optical waveguides. The students will also learn the applications of optical waveguide devices, both in the forms of optical fibers and planar lightwave circuits.

Since this is an advanced undergraduate course, I would like to create a vibrant discussion environment. I'd propose we experiment on a form adapting the *flip-learning* concept. You are requested to read through the designated text pages before coming to class, and in the classroom, we focus the discussions on your specific questions. Therefore, active participation is heavily expected.

Required background knowledge: Electromagnetics, Introduction to Optoelectronics I.

Textbook:

C.-L. Chen, *Foundations for Guided-Wave Optics*, Wiley-Interscience, 2007.

References:

K. Kawano and T. Kitoh, *Introduction to Optical Waveguide Analysis*, Wiley, 2001.

R. Kashyap, *Fiber Bragg Gratings*, Elsevier, 2010.

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

Teaching Method:

Lectures in English, discussions in English/Chinese.

Course Content:

- Review: Wave behaviors at optical interfaces
- Step-index thin-film waveguides
- Three-dimensional rectangular waveguides
- Directional couplers and devices
- Guided wave and arrayed waveguide gratings
- Step-index fibers and devices
- Single-mode fiber pulse propagation
- Beam-propagation method (if time permits)

Grading:

- Discussion and participation (40%)
- Homework (20%)
- Mid-term examination (20%)
- Final examination (20%)

Ethics policy:

As a student of NTHU, you are here to learn.

1. You should always bear honor and confidence in your mind. You should be responsible for your own grade and in a longer term, your future. You can start by finishing your own class assignments.
2. Plagiarism in any form is unacceptable. The plagiarist will receive a (-100)% for that assignment. I do, however, encourage discussions among classmates.
3. Misconducts during examinations will result in failure of this course.
4. Overly active club participation makes no excuse for late homework and/or missing exams.