National Tsing Hua University

10510 EE 411001 Introduction to Optical Waveguides

Course Syllabus

Class time: M5M6W5 Location: Delta Room 202

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

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

Course Description:

The intent of this course is to allow full understandings toward 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 paricipation is heavily expected**.

Required background knowledege: 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.

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

Teaching Method:

Lectures in English, discussions in English/Chinese.

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Course Content:

- Review: Wave behaviors at optical interfaces
- Step-index thin-film waveguides
- Three-dimensional rectangular waveguides
- Beam-propagation method
- Directional couplers and devices
- Guided wave and arrayed waveguide gratings
- Step-index fibers and devices
- Nonlinear fiber optics

Grading:

Discussion and participation (20%)

Homework (25%)

Examination (25%)

Final presentation/project (30%)

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.