



National Tsing Hua University

10210 EE 313000 Introduction to Optoelectronic Engineering

Course Syllabus

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Class time: W5W6R8 Location: Delta 212

Course Description:

1. This is an introductory course into the field of optoelectronics. I am assuming you have sufficient background knowledge regarding electromagnetic waves.
2. Handouts and reading materials will be provided.
3. Be prepared in terms of regular reading materials, homeworks, and quizzes.

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

References:

Topics 1,2:

Jenkins and White, *Fundamentals of Optics*, 4th ed., McGraw Hill (2001).

Hecht, *Optics*, 4th ed., Addison Wesley (2001).

Topic 3: Yariv and Yeh, *Optical Waves in Crystals*, Wiley (1984).

Topics 4,5: Kasap, *Optoelectronics and Photonics*, Prentice Hall (2001).

Course Content:

1. Geometrical optics
 - a. Light rays
 - b. Ray tracing: ABCD matrix
 - c. Imaging using thin lens
 - d. Aberrations
2. Wave optics
 - a. Basics of EM waves
 - b. Plane wave propagation
 - c. Coherence and interference
 - d. Scattering and diffraction
 - e. Superposition in time and space



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- f. Concept of dispersion
- 3. Polarization optics
 - a. Polarization states, Jones matrix
 - b. Optical birefringence
 - c. Optical polarization devices
- 4. Optical waveguides
 - a. Slab waveguides
 - b. Optical fibers
- 5. Common optoelectronic devices
 - a. Modulators: electro-optics effects
 - b. Photodetectors
 - c. Amplifiers and lasers

Grading:

Homework (no late turn-in) (20%, no normalization)

Quizzes (20%, no normalization)

Two mid-term examinations (20% each)

Dates: **to be announced**

Final examination (20%)

Date: 1/15/2014

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.