



**National Tsing Hua University**  
10110 EE 313000 Introduction to Optoelectronic Engineering

**Course Syllabus**

教師：黃承彬 (robin@ee.nthu.edu.tw)                      台達館 859   Ext. 62180

助教代表：戴文華 (denny78512@hotmail.com)            工三館 119   Ext. 34007

Class time: W5W6R8            Location:   EECS Room 206

**Course Description:**

1. This is an introductory course into the field of optoelectronics. I am assuming you have sufficient background knowledge regarding electromagnetic waves, and you are selecting this course because you are likely to major in the fields of optics and photonics.
2. There is no textbook. Instead, I plan to cover a wide selection of topics, and you are responsible of taking good notes during the course and reading the relevant handouts afterwards.
3. Be prepared in terms of heavy loading such as **weekly** reading materials, homeworks, and quizzes.

**Class notes:**

Course materials will be available on <http://moodle.nthu.edu.tw>

**References:**

Topics 1,2:

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

Hecht, *Optics*, 4<sup>th</sup> 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).

**Teaching Method:**

Lectures and discussions in Chinese.



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## Course Content:

1. Geometrical optics
  - a. Light rays
  - b. Ray tracing
  - c. Imaging using thin lens
  - d. Aberrations
2. Wave optics
  - a. Basics of EM waves
  - b. Plane wave propagation
  - c. Gaussian beam
  - d. Formation of optical pulses: superposition
  - e. Concept of dispersion
  - f. Optical grating: the concept of diffraction
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 (40%)

Dates: **to be announced**

Final examination (20%)

Date: 1/16/2013



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## **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.