



**National Tsing Hua University**  
10120 IPT 544000 Selected Topics in Ultrafast Optics

**Course Syllabus**

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Class time: M5M6R5 Location: Delta 212

**Course Description:**

This course provides discussions and lectures so that the students may develop deeper understandings toward recent advancements in the field of ultrafast optics. The students will be asked to survey among top journal articles, express their opinions and join open discussions. Prior knowledge in ultrafast optics is beneficial but not required.

**Class notes:** <http://lms.nthu.edu.tw>

**References:**

A. M. Weiner, *Ultrafast Optics*, (Wiley, 2009). (NTHU library e-book)

J. Ye and S. T. Cundiff, *Femtosecond optical frequency comb: principle, operation and application*, 1<sup>st</sup> Ed, (Springer, 2004). (NTHU library e-book)

F. X. Kaertner, *Few-cycle laser pulse generation and its applications*, 1<sup>st</sup> Ed, (Springer, 2004). (NTHU library e-book)

Recent journal articles.

**Teaching Method:**

Lectures mainly in English; discussions in Chinese/English.



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**Course Content:**

- Brief review to *Ultrafast Optics*
- Second-order ultrafast nonlinear optics
- Third-order ultrafast nonlinear optics
- Generation and applications of optical frequency combs
- Manipulations of ultrashort optical pulses
- Ultrafast spectroscopy

**Grading:**

Homework (25%)

Two mid-term examinations (50%)

Final project (25%)