

超快光學特論－課程大綱

(09710 IPT 544000: Selected Topics in Ultrafast Optics; M2M3M4)

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課程說明 (Course Description):

本課程旨在以「超快光學」課程之理論基礎，更進一步引領學生了解世界上超快光學之最新發展與實際應用。本課程預期涵蓋之範疇包括超快光學在物理、通訊、化學反應機制、和生物顯微技術上的實際應用，以期提供不同專長領域之學生一個對超光學全面並且深入的認識機會。本課程同時期待能夠訓練學生查詢世界頂尖期刊，以及提供整理、歸納、公開表達的機制。

教材 (Course Materials): Downloadable from above website under Courses.

參考書目 (References):

A. M. Weiner, *Ultrafast Optics*, Wiley (in press).

J. Ye and S. T. Cundiff, *Femtosecond optical frequency comb: principle, operation and application*, 1st Ed, Springer 2004. (optional).

F. X. Kaertner, *Few-cycle laser pulse generation and its applications*, 1st Ed, Springer 2004. (optional).

教學方式 (Teaching Method): Offered in English

教學內容與進度 (Course Outline):

- ◆ Brief review on background information
- ◆ Generations and applications of optical frequency combs
- ◆ Manipulations of ultrashort optical pulses
- ◆ Ultrafast nonlinear optics: second-order and third-order
- ◆ Ultrafast spectroscopy
- ◆ Ultrafast terahertz radiation
- ◆ Few-cycle lasers and sciences: attosecond pulse generation, soft X-rays

成績考核 (Grading): homework (30%), midterm (30%), and final report (40%).

Final report: Come and discuss with me on your preferred topic.