

103 學年第 2 學期 雷射生物奈米科學 Laser Bio/Nano Science 課程綱要

課程名稱：（中文）雷射生物奈米科學		開課單位	分子碩			
（英文）Laser Bio/Nano Science		永久課號	IAC6619			
授課教師：增原宏						
學分數	3	必/選修	選修	開課年級	*	
先修科目或先備能力：						
Physical, Quantum, Organic, and/or Polymer Chemistry						
課程概述與目標：						
Starting from fundamental photophysics and photochemistry, recent developments of spectroscopic and imaging methods utilizing lasers and optical microscopes are introduced and their high potential is demonstrated. Various subjects on nano materials such as nano polymer films, molecular nanocrystals, gold nanoparticles, and so on are presented and discussed. Nanoparticle preparation and molecular crystallization by laser are now intensively extended and their applications are expected, while manipulation and patterning of living cells by femtosecond laser tsunami have received much attention in the relevant life science field. Integrating the detailed explanation and recent results, one possible picture of Laser Bio/Nano Science will be given.						
教科書（請註明書名、作者、出版社、出版年等資訊）	(Reference) Masuhara, Kawata, and Tokunaga Ed., “Nano Biophotonics” Elsevier, 2007					
課程大綱		分配時數				備註
單元主題	內容綱要	講授	示範	習作	其他	
教學要點概述：						
1.學期作業、考試、評量 Discussion in the Classroom, 40%; Midterm Exam, 30%; Final Exam, 40%						
2.教學方法及教學相關配合事項(如助教、網站或圖書及資料庫等)						
師生晤談	排定時間	地點		連絡方式		
	Wednesday 17:00-18:00	Tin Ka Ping Build. room 613		Ext. 56593 masuhara@masuhara.jp		
每週進度表						
週次	上課日期	課程進度、內容、主題				
1	2/25	Spectroscopy and nonlinear Photochemistry				

2	3/4	Single nanoparticle fluorescence spectroscopy
3	3/11	Rayleigh light scattering spectroscopy of nanoparticles
4	3/18	Rayleigh light scattering imaging of nanoparticles
5	3/25	Time-resolved reflection spectroscopy on solid photochromism
6	4/1	Time-resolved interferometry and surface light scattering imaging
7	4/8	Laser ablation of molecular solids
8	4/15	Laser ablation dynamics of polymer films
9	4/22	Laser fabrication of nanoparticles in solution
10	4/29	Midterm examination
11	5/6	Intermediate Femtosecond laser crystallization of proteins
12	5/13	Femtosecond laser manipulation of living cells
13	5/20	Laser trapping chemistry of microparticles
14	5/27	Laser trapping dynamics of nanoparticles
15	6/3	Laser trapping chemistry of nanoparticles
16	6/10	Laser trapping crystallization and crystal growth
17	6/17	Recent topics on Laser ablation and trapping chemistry
18	6/24	Term-end exam

※ 請同學遵守智慧財產權觀念及勿使用不法影印教科書。

備註：

1. 其他欄包含參訪、專題演講等活動。
2. 請同學遵守智慧財產權觀念及勿使用不法影印教科書。

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