課程資訊	
課程名稱	高等流體力學 Advanced Fluid Dynamics
開課學期	114-1
授課對象	化學工程學研究所
授課教師	林立強
課號	ChemE7007
課程識別碼	524EM1210
班次	02
學分	3.0
全/半年	半年
必/選修	必修
上課時間	星期二 3,4(10:20~12:10)星期五 2(9:10~10:00)
上課地點	慶琅廳慶琅廳
備註	本課程以英語授課。核心課程。 限碩士班以上 總人數上限：60 人
課程簡介影片	
核心能力關聯	核心能力與課程規劃關聯圖
課程大綱	
為確保您我的權利,請尊重智慧財產權及不得非法影印	
課程概述	The transport of momentum, energy and mass is essential to the function of all non-living and living systems. This course has a particular focus on the momentum part and is designed to extend the student’ s understanding of transport processes beyond the level normally associated with undergraduate education or other introductions to the subject. While acting in some sense as a review of basic concepts, this class delves into advanced materials concerned with various subjects (multi-variable systems and nonlinear problems) and tools (differential balances; boundary layer theory; solution of ordinary and partial differential equations). Many classical problems are covered, such as those of Stokes.

課程目標	The objective of this course is to equip students with fundamental knowledge and mathematic skills to understand and describe the transport phenomenon of flow systems. The breakdowns of the course content are as the followings: 1. Overview of transport phenomena 2. Review of vectors and tensors 3. Viscosity and Newtonian vs. non-Newtonian fluids 4. Mechanisms of momentum transport 5. Microscopic momentum balances and velocity distributions 6. Equation of motions 7. Velocity distributions of systems with only one independent variable such as: a. Flow on a flat/inclined plat or in parallel plates b. Hagen-Poiseuille flow 8. Dimensional analysis 9. Velocity distributions of systems with more than one independent variables such as: a. Cone-and-plate viscometer and its rheology b. Stokes flow and Stokes law c. Flow to a rotating disk d. A flat plate in an infinite fluid impulsively set into motion e. Periodic oscillation of a flat plate f. Startup of plane Couette flow 10. Boundary layer theory 11. Numerical methods (brief introduction) With the course, graduate students will have the core ability as a chemical engineer to analyze the velocity field of a flow system and calculate associated properties such as drag forces.
課程要求	
預期每週課前或/與課後學習時數	
Office Hours	每週一 12:00~13:30 備註： Held in person, every Monday from 1200-1330pm, in my office (ChemE Building I, Room 304)
指定閱讀	
參考書目	

評量方式 (僅供參考)	

課程進度		
週次	日期	單元主題
無資料		