

# 2021 Spring Semester Department of Chemical Engineering & Biotechnology Ph.D Program Qualifying Exam Syllabus

Subject Title	Date	Place	AM 9 : 00 ~ 12 : 00	PM 1 : 30 ~ 4 : 30
Advanced Chemical Reaction Engineering	2021 July 6 (Tue)	Chemical Engineering Building 1F Room 102		<p>A. Reference books:</p> <p>Elements of Chemical Reaction Engineering, 4th Edition H. Scott Fogler, University of Michigan</p> <p>B. Topics:</p> <ul style="list-style-type: none"> <li>● Mole Balances</li> <li>● Conversion and Reactor Sizing</li> <li>● Rate Law and Stoichiometry</li> <li>● Isothermal Reactor Design</li> <li>● Collection and Analysis of Rate Data</li> <li>● Multiple Reactions</li> <li>● Reaction Mechanisms, Pathways, Bioreactions and Bioreactors</li> <li>● Catalysis and Catalytic Reactors</li> <li>● External Diffusion Effects on Heterogeneous Reactions</li> <li>● Diffusion and Reaction in Porous Catalysts</li> <li>● Distributions of Residence Times for Chemical Reactors</li> </ul>

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Biomaterials	2021 July 6 (Tue)	Chemical Engineering Building 1F Room 102		<p>C. Other information:  1. Access to the Internet, printed materials, and electronic devices is prohibited during the exam.  2. Close book.  3. Calculator and ruler are allowed.</p> <p>A. Reference books:  Biomaterials Science: An Introduction to Materials in Medicine, 2e, Buddy Ratner , Allan Hoffman , Frederick Schoen , Jack Lemons, Academic Press, San Diego, Cal. USA.</p> <p>B. Topics:  1. Materials Science and Engineering  2. Biology and Medicine  3. Practical Aspects of Biomaterials</p> <p>C. Other information:  1. 禁止攜帶影印資料、筆記本及智慧型手機  2. Close Book  3. 可帶計算機、直尺</p>