

**朝陽科技大學 095學年度第1學期教學大綱**  
**Special Topics of Biochemical Engineering 生化工程特論**

<b>當期課號</b>	7191	<b>Course Number</b>	7191
<b>授課教師</b>	賴龍山	<b>Instructor</b>	LAI, LONG SHAN
<b>中文課名</b>	生化工程特論	<b>Course Name</b>	Special Topics of Biochemical Engineering
<b>開課單位</b>	應用化學系碩士班二A	<b>Department</b>	
<b>修習別</b>	選修	<b>Required/Elective</b>	Elective
<b>學分數</b>	3	<b>Credits</b>	3
<b>課程目標</b>	<p>本課程主要探討細胞生理活性物質(例如細胞、酵素或抗體等)的生產製程與其最適化。欲瞭解生化工程之大要需對細胞的生理活性物質特性與基本的化學工程運作原理有深刻的認識。由於受限於上課時數，故本課程雖無法涵蓋與生化工程相關的每一章節，但對於細胞、酵素與微生物代謝作用以及代謝物之生產將在課程中與予討論。簡言之，本課程主要的目的是為本系同學開啓一條不同於有機或分析化學之另一專長，但過程中是處處充滿學習、挑戰之路。</p>	<b>Objectives</b>	<p>Processing of biological materials such as cells, enzymes or antibodies are the central domains of "Biochemical Engineering". Success in biochemical engineering requires integrated knowledge of governing biological properties and basic principles of biochemical engineering methodology and strategy. In this course, we are unable to cover all the aspects of this field due to time limitation. However, the topics on cells, metabolism, enzymes, microbial metabolites and the processing will be discussed to our utmost. In short, the objectives of this course is mainly intended to start on this challenging and exciting path, where the students might be with less familiarity.</p>
<b>教材</b>	<p>1.自編講義 2.Biochemical Engineering Fundamentals</p>	<b>Teaching Materials</b>	<p>1.Notes 2.Biochemical Engineering Fundamentals (textbook)</p>
<b>成績評量方式</b>	<p>1.口頭報告50%(含每節課的課堂上提，問回答與討論) 2.期中考試25% 3.期末考試25% 4.課堂參與15%</p>	<b>Grading</b>	<p>1.Oral presentation 50% (including questions and discussions in classroom) 2.Middle examination 25% 3.Final examination 25% 4.Course attendance 15%</p>
<b>教師網頁</b>	<a href="mailto:lslai@mail.cyut.edu.tw">lslai@mail.cyut.edu.tw</a>		
<b>教學內容</b>	<p>近代的生物技術源自於1960年代起分子生物學的蓬勃發展。現今生物技術的關鍵技術主要在於三方面：</p> <ol style="list-style-type: none"> <li>1.重組DNA技術</li> <li>2.融合瘤技術</li> <li>3.細胞培養與其放大技術(含微生物、動物細胞以及植物細胞)</li> </ol> <p>眾所週知，利用這些高科技來生產高單價化合物的過程就是生物化學工程所討論的主題，本課程將舉例說明微生物應用與其相關產業。但由於時間限制，本課程將探討生化工程的基本知識，主要涵蓋以下生技產物之生產或其工業應用：</p> <ol style="list-style-type: none"> <li>1.amino acids</li> <li>2.抗生素</li> <li>3.lipase</li> <li>4.hydantoinase</li> <li>5.二次代謝產物</li> <li>6.生物高分子</li> <li>7.生物性農藥</li> </ol>	<b>Syllabus</b>	<p>Biotechnology is initially originated from the research of molecular biology in 1960s. Today, the development of biotechnology is generally based on three major technologies:</p> <ol style="list-style-type: none"> <li>1.recombinant DNA technology</li> <li>2.hybridoma technology</li> <li>3.cell cultures and scale-up studies</li> </ol> <p>It has been widely recognized that the commercialization of biotechnology strongly depends on our understanding in the field of Biochemical Engineering. Due to the time limitations, this course is not intended to cover every aspect of bioprocesses. However, the fundamental knowledge for its applications will be addressed in class. For example, the following production processes or enzyme applications will be discussed in details:</p> <ol style="list-style-type: none"> <li>1.amino acids</li> <li>2.antibiotics</li> <li>3.lipase</li> </ol>

		4.hydantoinase 5.secondary metabolites 6.biopolymers 7.biopesticides
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