長庚大學生物科技產業碩士學位學程必選修科目表（一一〇學年度入學適用）
Chang Gung University, Master Program in Biotechnology Industry
Curriculum for MS Program (2021~2022)

必選修 Required / Elective	科目名稱 Course Title	學分 Credit	開課年級 Year	上學期 Fall	下學期 Spring	備註 Note
先修 **Prerequisites Courses**	普通生物學 General Biology	3				不列入畢業學分 Excluded from core credit
	普通生物學實驗 General Biology Laboratory	1				不列入畢業學分 Excluded from core credit
	生物化學 Biochemistry	3				不列入畢業學分 Excluded from core credit
	生物化學實驗/ 生命科學實驗/分子生物學實驗 Biochemistry Laboratory / Life Science Laboratory / Molecular Biology Laboratory	1				不列入畢業學分 Excluded from core credit
必修 **Required Courses**	書報討論 Seminar	2	1	1	1	必修四學分 Required courses for a total of 4 Credits.
	書報討論 Seminar	2	2	1	1	
	生技製藥研發 Biopharmaceutical Development	2	1	2		碩博合開 Offered jointly by PhD and Master program.
	產業研發實務 Industrial R&D	1	1		1	必修二學分，碩博合開 Required courses for a total of 2 Credits. Offered jointly by PhD and Master program.
	產業研發實務 Industrial R&D	1	2		1	
	生技產業實習 Biotechnology Practicum	4	2	4		暑期開課 Summer Course
	碩士論文 Master's Thesis	6				
生醫領域 選修 **Elective courses in Biomedical Field**	生技產業新知論壇 BioBusiness Awakening Forum	2	1	1	1	碩博合開 Offered jointly by PhD and Master program.
	生技智慧財產權 Intellectual Properties in Biomedical Industry	2	1	2		
	生技法規及 cGMP 優良製造規範 Biotechnology Regulations and cGMP Guidelines	1	1	1		
	生物資訊學 Bioinformatics	2	1	2		
	高等生物技術學 Advanced Biotechnology	2	1	2		
	高級生物統計學 Advanced Biostatistics	2	1	2		

Course					Notes
醫學檢驗新知特論 Advances in Laboratory Medicine	2	1	2		
奈米生物技術之醫學應用 Applications of Nanobiotechnonlgy in Medicine	2	1	2		
應用免疫技術實驗 Immunological Techniques Laboratory	1	1	1		
應用於人類疾病研究之最新生物技術 Recent advances in Biotechnology Applied in human Diseases	1	1	1		
分子檢驗技術新知 The Frontiers in Molecular Diagnostics Technology	1	1	1		
尖端生物技術實驗-分子細胞學 Advanced Biotechnology Laboratory-Molecular Cell Biology	2	1	2		暑期開課 Summer Course
現代生物技術及分子診斷實驗 The Frontier of Biotechnology in Molecular Diagnosis Laboratory	2	1	2		暑期開課 Summer Course
人類遺傳疾病之分子診斷實驗 Laboratory of Molecular Diagnosis of Human Genetic Disorders	1	1	1		暑期開課，偶數學年度開課 Summer Course, Offered Bi-annually
流式細胞儀分析技術實驗 Lab of Flow Cytometric Technology	1	1	1		暑期開課，偶數學年度開課 Summer Course, Offered Bi-annually
基礎胚胎幹細胞培養實驗 Embryonic Stem Cell Culture Techniques Laboratory	1	1	1		暑期開課，奇數學年度開課 Summer Course, Offered Bi-annually
感染症疾病檢測技術 Infection Diseases Detection Technologies	1	1	1		奇數學年度開課 Offered Bi-annually
三創（創新、創意、創業）課程 (1) Innovation, creativity and entrepreneurship courses (1)	2	1	2		
生物製藥檢測操作 (1) Biopharmaceutical Operation (1)	3	1	3		
創新創業範例研究和實務 Innovation and entrepreneurship: case studies and practice	2	1	2		碩博合開 Offered jointly by PhD and Master program.
智慧型控制系統 Intelligent Control Systems	3	1	3		
神經網路與深度學習 Neural Networks and Deep Learning	3	1	3		
三創（創新、創意、創業）課程 (2) Innovation, creativity and entrepreneurship courses (2)	2	1		2	
生物製藥檢測操作 (2) Biopharmaceutical Operation (2)	3	1		3	

	疫苗發展的生物學基礎 Biologic basis of vaccine development	2	1		2	奇數學年度開課 Offered Bi-annually
	科學研究方法 Scientific Methods	2	1		2	
	幹細胞生物學 Stem Cell Biology	2	1		2	
	生技健康產業經營策略 Business strategy for the biotech and health industries	2	2	2		
	創新產品設計與開發 Innovative Product Design and Development	3	2	3		
	生技健康產業財務管理 Financial Management of Biotech and Health Industry	2	2		2	奇數學年度開課 Offered Bi-annually
管理領域選修 **Elective Courses in Management Field**	企業經營(1) Contemporary Business (I)	3	1	3		英文授課 English as Medium of Instruction
	企業倫理 Business Ethics	3	1	3		英文授課 English as Medium of Instruction
	顧客關係管理與商業智慧 Customer Relationship Management and Business Intelligence	3	1	3		英文授課 English as Medium of Instruction
	管理經濟 Managerial Economics	3	1	3		英文授課 English as Medium of Instruction
	數位行銷 Digital Marketing	3	1	3		英文授課 English as Medium of Instruction
	成本會計 Cost Accounting	3	1	3		英文授課，奇數學年度開課 English as Medium of Instruction. Offered Bi-annually.
	應用統計 Applied Statistics	3	1		3	英文授課 English as Medium of Instruction
	企業經營(2) Contemporary Business (II)	3	1		3	英文授課 English as Medium of Instruction
	策略管理 Strategic Management	3	1		3	英文授課 English as Medium of Instruction
	管理個案研討 Business Case Study	2	1		2	英文授課 English as Medium of Instruction
	科技管理 Technology Management	3	1		3	英文授課 English as Medium of Instruction
	企業分析與公司評價 Business Analysis and Valuation	3	1		3	英文授課 English as Medium of Instruction
	供應鏈管理 Supply Chain Management	3	1		3	英文授課 English as Medium of Instruction
	策略性人力資源管理 Strategic Human Resource Management	3	1		3	英文授課 English as Medium of Instruction
	數位時代之品牌經營 Branding Management in the Digital Age	3	2		3	英文授課 English as Medium of Instruction

	大數據應用與電子商務 Big Data Application and Electronic Commerce	3	2	3		英文授課 English as Medium of Instruction
	企業營運分析 Business Operations Analysis	3	2	3		英文授課 English as Medium of Instruction

Note：

1. 畢業學分：34 學分。
   Core total: 34 Credits.
   (1) 必修 12 學分。
       Required courses: 12 Credits
   (2) 選修 16 學分。
       Elective courses: 16 Credits
   (3) 論文 6 學分(學位考試通過後給予)。
       Master Thesis: 6 Credits (given after passing the final defense)
2. 須達英文畢業門檻方可畢業：
   Students have to take one of the following English proficiency test and meet its respective requirement before graduation:
   (1) 全民英檢中高級初試及格。
       General English Proficiency Test (GEPT) High-Intermediate level passed.
   (2) 托福 500 分（含）以上。
       TOFEL Score 500 and above.
   (3) 電腦托福 173 分（含）以上，網路托福 61 分（含）以上。
       TOFEL iBT Score 173 and above, TOFEL CBT Score 61 and above.
   (4) 外語能力測驗（FLPT-English）平均成績 65 分（含）以上。
       FLPT-English Average Score 65 and above.
   (5) IELTS 5 級（含）以上。
       IELTS Band 5 and above.
   (6) 多益測驗（TOEIC）600 分（含）以上。
       TOEIC Score 600 and above.
   (7) 劍橋博思國際職場英語能力測驗（BULATS）45 分(含)以上。
       BULATS Score 45 and above.
   (8) 以上校外檢測未過，持相關成績單可參加校內英檢測驗，總成績超過 160 分（含），且聽力及閱讀分數皆為 72 分以上。
       Students who have taken once the listed English proficiency test and failed meeting the requirement would be eligible for taking On-Campus English Proficiency Test, which requires the final result of score 160 and above, including score 72 and above in listening and reading.
   (9) 若第八項仍未通過，則可選擇校內英語工作坊，參加一學期即可。
       Students can also take part in one semester of English workshop if students failed the examinations listed above.
   (10) 英語畢業資格需於第二階段學位考試申請前，持通過證明繳交至學程辦公室審核。
        Students should submit the score report to program office for the review of English requirement for graduation before applying the second stage of degree examination.
3. 學程先修基礎課程(普通生物學 3 學分，普通生物學實驗 1 學分，生物化學 3 學分，生物化學實驗、生命科學實驗或分子生物學實驗 1 學分)，此基礎課程不列入畢業學分，若曾修讀過大學部或研究所之相關課程且成績及格者，得申請免修。
   Prerequisites are required for students pursuing this master program (General Biology 3 Credits, General Biology Laboratory 1 Credits, Biochemistry 3 Credits, Biochemistry Laboratory / Life Science Laboratory / Molecular Biology Laboratory 1 Credits), while these prerequisites are excluded from core credits. Prerequisites are exempted for students who have completed and passed the related courses during undergraduate or postgraduate

degree.

4. 本學程選修科目可依研究或實務需要，經指導教授同意，選擇本校研究所課程（未列於必選修課目表者）作為本學程選修學分，但以學程要求選修學分之二分之一（含）為限。

With the consent of the advisor, students may also take courses offered by other graduate institutes in CGU to meet the credit requirement for graduation; only the total credits earned from other institutes cannot exceed 50% of the total elective credits for graduation.

5. 學生所選欲修習之科目，需經過指導教授之簽名同意。

Course selection and registration should be approved and signed by the thesis mentor.