長庚大學生物科技產業博士學位學程必選修科目表（一一三學年度入學適用）
Chang Gung University, PhD Program in Biotechnology Industry
Curriculum for MS Program (2024~2025)

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
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	
	博士論文 PhD thesis	6				
生技原理領域選修 **Elective courses in Principle Applications in Biotechnology**	藥理學 Pharmacology	4	1	4		生醫所博班合開 Offered jointly by Graduate Institute of Biomedical Sciences
	高等生物化學 Advanced Biochemistry	3	1	3		生醫所博班合開 Offered jointly by Graduate Institute of Biomedical Sciences
	細胞生物學 Cell Biology	3	1	3		生醫所博班合開 Offered jointly by Graduate Institute of Biomedical Sciences
	疫苗研發 Vaccine Development	3	1	3		英文授課 English as Medium of Instruction 生醫所博班合開 Offered jointly by Graduate Institute of Biomedical Sciences 偶數學年度開課 Offered bi-annually
	生物資訊分析 Bioinformatics Analysis	2	1	2		生醫所博班合開 Offered jointly by Graduate Institute of Biomedical Sciences
	高等免疫學 Advanced Immunology	3	1	3		英文授課 English as Medium of Instruction 生醫所博班合開 Offered jointly by Graduate Institute of Biomedical Sciences
	高級生物統計學 Advanced Biostastics	2	1	2		生醫所博班合開 Offered jointly by Graduate Institute of Biomedical Sciences
	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.
	生理學 Physiology	4	1		4	生醫所博班合開 Offered jointly by Graduate Institute of Biomedical Sciences
	分子生物學 Molecular Biology	4	1		4	生醫所碩博班合開 Offered jointly by Graduate Institute of Biomedical Sciences

領域	課程名稱 Course					備註 Notes
	製藥生技學特論 Special Topics in Industrial Pharmaceutical Biotechnology	2	1		2	生醫所合開 Offered jointly by Graduate Institute of Biomedical Sciences
生技實務領域選修 **Elective courses in Practical Applications in Biotechnology**	生技產業創新市場 BioBusiness Creative Market	1	1	1		碩博合開 Offered jointly by PhD and Master program.
	生物資訊分析實作 Bioinformatics Analysis-Practice	1	1	1		生醫所博班合開 Offered jointly by Graduate Institute of Biomedical Sciences
	生技產業之應用生物統計實務 Applied biostatistics in biotechnology industry	2	1	2		
	生技產業之科技評估實務 Health technology assessment in biotechnology industry	2	1	2		
	創新創業範例研究和實務 Innovation and entrepreneurship: case studies and practice	2	1	2		英文授課 English as Medium of Instruction 碩博合開 Offered jointly by PhD and Master program.
	健康資料庫實務應用 Practical Methods for Secondary Data Analysis	3	1		3	臨醫所碩士班臨資組合開 Offered jointly by Clinical Information group in Graduate Institute of Clinical Medicine
	臨床資訊實務 Clinical Informatics : A Practical Approach	2	1		2	臨醫所碩士班臨資組合開 Offered jointly by Clinical Information group in Graduate Institute of Clinical Medicine
	醫療科技評估方法學 (1) Methods for Health Technology Assessment (I)	3	1		3	臨醫所碩士班臨資組合開 Offered jointly by Clinical Information group in Graduate Institute of Clinical Medicine
	生技產業之臨床試驗實務 Clinical trials in biotechnology industry	2	1		2	
	專案計畫與專利撰寫 Project Plan and Patent Writing	2	2	2		碩博合開 Offered jointly by PhD and Master program. 奇數學年度開課 Offered bi-annually
	生技產業分析與公司評價 Biotechnology Industrial Analysis and Corporate Valuation	2	1		2	碩博合開 Offered jointly by PhD and Master program. 偶數學年度開課 Offered bi-annually
	生醫創新創業-成為創業家的知識和步驟 Knowledge and steps to become an entrepreneur in the bio-industrial					英文授課 English as Medium of Instruction 碩博合開 Offered jointly by PhD and Master program.
	醫療科技評估方法學 (2) Methods for Health Technology Assessment (II)	2	2	2		臨醫所碩士班臨資組合開 Offered jointly by Clinical Information group in Graduate Institute of Clinical Medicine
	藥廠與專利申請實務特論 Special Topics in The Pharmaceutical Factory and Patent Application	2	2	2		生醫所博班合開 Offered jointly by Graduate Institute of Biomedical Sciences

Note：
1. 畢業學分：28 學分。

Core total: 28 Credits
- (1) 必修 8 學分。

    Required Courses：8 Credits
- (2) 選修 14 學分。

    Elective Courses：14 Credits
- (3) 論文 6 學分(學位考試通過後給予)。

    PhD Thesis with 6 credits will be awarded after degree examination
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。

        Pass the High-Intermediate Test of GEPT.
    - (2) 托福 500 分（含）以上。

        TOEFL score of 500 and above.
    - (3) 網路托福 61 分（含）以上。

        iBT TOEFL score of 61 and above.
    - (4) 外語能力測驗（FLPT-English）平均成績 65 分（含）以上。

        FLPT-English with an average score of 65 and above.
    - (5) IELTS 5 級（含）以上。

        IELTS 5 and above.
    - (6) 多益測驗（TOEIC) 600 分（含）以上。

        TOEIC Score 600 and above.
    - (7) 劍橋領思英語檢測(Linguaskill)145 分(含)以上。

        Linguaskill score of 145 and above.
    - (8) 其他同等級之國際通用英檢能力測驗(須自備考試相關文件)。

        Other equivalent international English proficiency tests (relevant examination documents must be provided).
    - (9) Englishscore（British council）的 Coreskill 測驗達 B2 level(TEOIC：785，EnglishScore：400）。English score B2 level.
    - (10) 參加本校自辦之校內英檢考試，通過校內英檢標準。

        Participate in the internal English proficiency test organized by the school and meet the internal test standards.
    - (11) 修習一學期之英文補救教學「英文工作坊」課程，取得及格成績。

        Complete one semester of the remedial English course "English Workshop" and achieve a passing grade.
    - (12) 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. 碩士生逕讀本博士學程時，畢業學分數為 40 學分，含必修 8 學分，選修 26 學分，及博士論文 6 學分。以碩士獲得之學分抵免博士學程之選修學分，以 16 學分（含）為限且不得抵免書報討論及產業研發實務。

    For master students with direct admission to PhD program, students have to earned 40 credits, including 8 credits of required courses, 26 credits of selected courses, and 6 credits of PhD thesis. The credits earned from master degree only can waive a maximum of 16 credits in PhD program; "Seminar" and "Industrial R&D" are rejected to waive.
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.