

長庚大學生物科技產業博士學位學程必選修科目表（一〇九學年度入學適用）

Chang Gung University, PhD Program in Biotechnology Industry

Curriculum for MS Program (2020~2021)

| 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 |
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| 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. |
| | 藥理學 Pharmacology | 4 | 1 | 4 | | |
| | 高等生物化學 Advanced Biochemistry | 3 | 1 | 3 | | |
| | 細胞生物學 Cell Biology | 3 | 1 | 3 | | |
| | 疫苗研發 Vaccine Development | 3 | 1 | 3 | | 偶數學年度開課 Offered bi-annually |
| | 生物資訊分析課程 Bioinformatics | 2 | 1 | 2 | | |
| | 高等免疫學 Advanced Immunology | 3 | 1 | 3 | | |
| | 高級生物統計學 Advanced Biostatistics | 2 | 1 | 2 | | |
| | 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 | | |
| | 類神經網路 Neural Network | 3 | 1 | 3 | | 奇數學年度開課 Offered bi-annually |
| | 生理學 Physiology | 4 | 1 | | 4 | |
| | 分子生物學 Molecular Biology | 4 | 1 | | 4 | |
| | 製藥生技學特論 Special Topics in Industrial Pharmaceutical Biotechnology | 2 | 1 | | 2 | |
| | 臨床試驗之設計與執行 The Study Design and Conduct of Clinical Trials | 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 |

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| 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 | |
| 生技產業分析與公司評價 Biotechnology Industrial Analysis and Corporate Valuation | 2 | 1 | | 2 | |
| 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 | | |
| 專案計畫與專利撰寫 Project Plan and Patent Writing | 2 | 2 | 2 | | |

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| 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 |

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| 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：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。

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. 碩士生選讀本博士學程時，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.