# 國立陽明交通大學醫療器材跨域學程實施要點

# National Yang Ming Chiao Tung University Medical Device Program Implementation Guidelines for Cross-Disciplinary Program

110.10.05 生物醫學暨工程學院 110 學年度第一學期院級課程委員會通過
110.12.02 110 學年度第 3 次校課程委員會通過
110.12.16 110 學年度第 2 次教務會議核備通過
111.04.01 生物醫學暨工程學院 110 學年度第二學期院級課程委員會通過
111.05.13 110 學年度第 5 次校課程委員會通過
111.06.16 110 學年度第 4 次教務會議核備通過
112.03.14 生物醫學工程學系 111 學年度第二學期課程暨學術委員會通過
112.03.28 生物醫學暨工程學院 111 學年度第二學期院級課程委員會通過
112.05.16 111 學年度第 3 次校課程委員會通過
112.05.30 111 學年度第 4 次教務會議核備通過
112.10.12 生物醫學工程學系 112 學年度第一學期課程暨學術委員會通過
112.10.17 生物醫學暨工程學院 112 學年度第一學期院級課程委員會通過
112.12.12 112 學年度第 2 次校課程委員會通過
114.03.17 生物醫學工程學系 113 學年度第二學期課程暨學術委員會通過
114.04.11 生物醫學暨工程學院 113 學年度第二學期院級課程委員會通過
114.05.12 113 學年度第 3 次校課程委員會通過

一、依據國立陽明交通大學跨域學程實施辦法，為鼓勵學生進行跨領域學習，建立跨域學習深度，協助學生拓展第二專長，提供學生可以在畢業學分不增加(或僅少量增加)情況下，修畢跨域學程，特訂定本要點。

I. The Implementation Guidelines are based on National Yang Ming Chiao Tung University Cross-Disciplinary Program Implementation Regulations to provide the opportunity for students to proceed cross-disciplinary learning without increasing graduate credits (or only a few extra credits) in order to encourage students to conduct cross-disciplinary study, build the depth of cross-disciplinary study, and assist students in expanding second specialty.

二、本學程課程係由生物醫學工程學系提出模組課程，模組課程分為「必修」、「選修」兩大類別科目，總學分數以 28 學分為原則。學生修習本跨域學程為第二專長模組課程，可於畢業證書上加註第二專長模組課程「醫療器材」為跨域專長。

II. This cross-disciplinary program is the cross-disciplinary module curriculum provided by Department of Biomedical Engineering in National Yang Ming Chiao Tung University. Module curriculum should include the required and elective courses of the field and the total credits will be 28 credits. Students who take the module courses in Cross- Disciplinary Program as their second expertise are granted to add “Medical Device” after the title of their original department on the diploma.

三、本系學生欲修習其他跨域學程者得於每學年度第二學期向本系提出申請，申請時註明欲申請的第二專長系所或學院，申請期限將由本系課程委員會提前一個月進行公告，公告中說明需準備的審查資料以及當年度本系開放給本系學生修讀跨域學程的名額，申請案經本系課程委員會審查通過後，需送到第二專長系所或學院審查，通過雙邊審查後，方可進入跨域學程。其所需修習的課程，列示於「生物醫學工程學系學生修讀其他跨域學程必選修科目表」，包含：校必修(28 學分)、本系必修課程(66 學分)、本系選修課程(23 學分)、以及

第二專長系所或學院的跨域模組課程，畢業學分以 145 學分為原則。

III. Students in our department who would like to take other cross-disciplinary programs should submit their application to our department during the second semester of any academic year. The department or college of the second specialty that the student would like to apply for must be remarked on the application form, and the application deadline would be announced one month in advance by the Curricular Committee at our department. The information of evaluation documents needed as well as the quota open to the students in our department to study for this program in the given year will be released on the announcement. The application should be sent to the department or the college of the second specialty for evaluation after it is approved by the Curricular Committee at our department. Students could only take the cross-disciplinary program after evaluation by both sides. The courses students need to take are listed on "The Required and elective courses list for the students in Biomedical Engineering department who study other cross-disciplinary program". The courses include required courses of the university (28 credits), required courses of our department (66 credits), elective courses of our department (23 credits), and the cross-disciplinary module curriculum of the second specialty department or the college; at least 145 credits for graduation.

四、外系學生欲修習跨域學程且選擇本學程做為其跨域專長者，同學得於每學年度公告申請期限內向其所屬學系（以下簡稱原系）提出申請，通過原系審查以及生物醫學工程學系審查後，方可進入跨域學程，本學程必選修課程與學分列示於「醫療器材跨域模組課程必選修科目表」。

IV. Students in other departments who would like to study cross-disciplinary program and choose Medical Device Program as their cross-disciplinary specialty should submit the application to the department they belong to by the deadline announced by the faculty. They could only take the cross-disciplinary program after approved by both their original department and Department of Biomedical Engineering. The regulation of required and elective courses and credits is listed on "The required and elective courses list for the students study cross-disciplinary module curriculum in Medical Device Program."

五、本系指定至少一名專任教師擔任跨域學程導師，與外系所或學院的跨域學程導師組成導師群，專責輔導跨域學程的學生。

V. Department of Biomedical Engineering, NYCU assigned at least one full-time teacher to mentor and formed a mentor group with teachers of cross-disciplinary program to guide students taking our program.

六、本要點如有未盡事宜，悉依本校學則及其他相關規定辦理。

VI. If there is any unaccomplished matter of these guidelines, it shall be handled in accordance with the school constitution of our university as well as other relevant regulations.

七、本要點經各級課程委員會通過後實施，修訂時亦同。

VII. These guidelines were approved by Curriculum Committee at all levels before putting it into practice, the same shall be done upon any amendment thereto.

# 生物醫學工程學系學生修讀其他跨域學程　必選修科目表 (A)

The Required and elective courses list for the students in Biomedical Engineering department who study other cross-disciplinary programs

| 類別<br>Category | 科目名稱<br>Course | 學分數<br>Credit | 開課單位<br>Department | 備註<br>Notes |
|---|---|---|---|---|
| 本系<br>必修課程<br>Required courses | 醫學工程導論<br>Introduction to Biomedical Engineering | 2 | 生物醫學工程學系 | |
| | 微積分 (I)<br>Calculus Ⅰ | 3 | 生物醫學工程學系 | |
| | 微積分 (II)<br>Calculus Ⅱ | 3 | 生物醫學工程學系 | |
| | 普通生物學<br>General Biology | 3 | 生命科學院 | |
| | 化學原理<br>Principles of Chemistry | 3 | 生物醫學影像暨放射科學系 | |
| | 化學原理實驗<br>Chemical Principle Lab | 1 | 生物醫學工程學系 | |
| | 普通物理學(一)<br>General Physics Ⅰ | 3 | 生物醫學工程學系 | |
| | 普通物理學(二)<br>General PhysicsⅡ | 3 | 生物醫學工程學系 | |
| | 普通物理學實驗<br>General Physics Lab | 1 | 生物醫學工程學系 | |
| | 計算機概論<br>Introduction to Computer Science | 3 | 生物醫學工程學系 | |
| | 有機化學<br>Organic Chemistry | 3 | 生物醫學工程學系 | |
| | 有機化學實驗<br>Organic Chemistry Lab | 1 | 生物醫學工程學系 | |
| | 程式語言<br>Programming Language | 3 | 生物醫學工程學系 | |
| | 工程數學（一）<br>Engineering Mathematics I | 3 | 生物醫學工程學系 | |
| | 工程數學（二）<br>Engineering Mathematics Ⅱ | 3 | 生物醫學工程學系 | |
| | 解剖學<br>Anatomy | 3 | 解剖學研究所 | |
| | 解剖學實驗<br>Anatomy Lab | 1 | 解剖學研究所 | |
| | 電路學<br>Circuit Theory | 3 | 生物醫學工程學系 | |
| | 電路學實驗<br>Circuit Theory Lab | 1 | 生物醫學工程學系 | |
| | 工程力學<br>Engineering Mechanics | 3 | 生物醫學工程學系 | |
| | 材料科學導論 | 3 | 生物醫學工程學系 | |

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|---|---|---|---|---|
| | Introduction to Materials Science | | | |
| | 科技論文導讀<br>Directed Reading: Science and Technology | 2 | 生物醫學工程學系 | |
| | 生物統計學<br>Biostatistics | 3 | 公共衛生研究所 | |
| | 生理學<br>Physiology | 3 | 生理學研究所 | |
| | 生理學實驗<br>Physiology Lab | 1 | 生理學研究所 | |
| | 臨床工程實務<br>Workshop in Clinical Engineering | 1 | 生物醫學工程學系 | |
| | 專題研究（一）<br>Independent Study I | 1 | 生物醫學工程學系 | |
| | 醫療器材上市法規實作<br>Regulatory Requirements of Medical Devices | 3 | 生物醫學工程學系 | |
| 本系<br>選修課程<br>Elective courses | 參照生物醫學工程學系學士班必選修科目表<br>Please refer to the list of required and elective course in Department of Biomedical Engineering | | 生物醫學工程學系 | 選修至少23學分<br>23 credits at least for elective courses |
| 其他<br>跨域學程<br>Other Cross-Disciplinary Program | 參照第二專長系所或學院的跨域模組課程<br>Please refer to the list of the module courses in Cross- Disciplinary Program | | | 至少 28 學分<br>28 credits at least |

# 醫療器材跨域模組課程 必選修科目表 (B)

The required and elective courses list for the students study cross-disciplinary module curriculum in Medical Device Program

| 類別<br>Category | 科目名稱<br>Course | 學分數<br>Credit | 開課單位<br>Department | 備註<br>Notes |
|---|---|---|---|---|
| 必修<br>Required | 解剖學<br>Anatomy | 3 | 解剖學研究所 | 必修9學分<br>9 credits for required courses<br><br>「解剖學」、「生理學」、「臨床醫學概論」至少修讀一門<br>At least one course out of Anatomy, Physiology, or Introduction to Clinical Medicine |
| | 生理學<br>Physiology | 3 | 生理學研究所 | |
| | 臨床醫學概論<br>Introduction to Clinical Medicine | 3 | 生物醫學工程學系 | |
| | 醫療器材上市法規實作<br>Practical Skills of the Regulatory Requirements of Medical Devices | 3 | 生物醫學工程學系 | |
| | 臨床工程實務<br>Workshop in Clinical Engineering | 1 | 生物醫學工程學系 | |
| | 醫學工程導論<br>Introduction to Biomedical Engineering | 2 | 生物醫學工程學系 | |
| 選修<br>Elective | 電子學(一)<br>Electronics I | 3 | 生物醫學工程學系 | 選修至少18學分<br>18 credits at least for elective courses |
| | 電子學(二)<br>Electronics II | 3 | 生物醫學工程學系 | |
| | 量測及儀表<br>Measurements and Instrumentation | 3 | 生物醫學工程學系 | |
| | 訊號與系統<br>Signals and Systems | 3 | 生物醫學工程學系 | |
| | 神經工程<br>Neuroengineering | 3 | 生物醫學工程學系 | |
| | 光電工程與 AI 生醫應用<br>Optical Engineering and AI in Biomedical Application | 3 | 生物醫學工程學系 | |
| | 電腦輔助設計與實作<br>Computer Aided Design & Practice | 3 | 生物醫學工程學系 | |
| | 生醫光學<br>Biophotonics | 3 | 生物醫學工程學系 | |
| | 高等材料力學<br>Advanced Material Mechanics | 3 | 生物醫學工程學系 | |
| | 電腦輔助工程分析<br>Computer Aided Engineering | 3 | 生物醫學工程學系 | |
| | 醫學雷射<br>Laser Medicine | 3 | 生物醫學工程學系 | |
| | 生醫材料導論<br>Introduction to Biomaterials | 3 | 生物醫學工程學系 | |
| | 物理化學<br>Physical Chemistry | 3 | 生物醫學工程學系 | |
| | 高分子科學 | 3 | 生物醫學工程學系 | |

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| | Polymer Science | | | |
| | 組織工程與再生醫學<br>Tissue Engineering and Regenerative Medicine | 3 | 生物醫學工程學系 | |
| | 電化學理論與傳感器實作<br>Fundamentals of electrochemistry and biosensor practices | 3 | 生物醫學工程學系 | |
| | 智慧醫材機械設計<br>Design of Machine Elements for Smart Medical Device | 3 | 生物醫學工程學系 | |
| | 材料選擇與設計<br>Selection and design of materials | 3 | 生物醫學工程學系 | |
| | 微流體科技<br>Microfluidic technology | 3 | 生物醫學工程學系 | |
| | 生物能源與催化<br>Bio Energy and Catalysis | 3 | 生物醫學工程學系 | |