

# 生物電子學分學程實施辦法

## Bioelectronics Interdisciplinary Program

一、為提供學生跨學域並具整合性之選課環境，特訂定本生物電子學程，其目標主要在於整合生科、電機、電子等不同學域內之課程，培養具備此跨學域專長基本訓練之學生。

The Bioelectronics Interdisciplinary Program is designed to provide students with an integrated learning environment that crosses traditional boundaries of academic disciplines. The goal of the program is to integrate the curricula of different academic fields such as biological science & technology, electrical & computer engineering, and electronics engineering to cultivate students with related training and skills.

二、凡本校學生，均得申請修讀本學程，修滿本學程規定之科目及學分者，由本校發給學程修畢證明。

All students in NCTU can apply for this program. Students who fulfill the program requirements will be granted with certifications issued by NCTU.

三、本學程由生物科技學院生物科技系所及電機學院電子工程系所共同規劃，相關系所開授課程。

The program is proposed by the Department of Biological Science & Technology and the Department of Electronics Engineering. All program courses are offered by the above mentioned or related departments and institutes.

四、本學程之學分規定：(1)修滿下列必(選)修課程達 25 學分(含)以上；(2)必修核心課程為 12 學分，生物、電子兩領域各選修 6 學分；(3)必修進階課程為 13 學分，包含『生物晶片技術』或『生物晶片與感測器』2 學分及生物電子相關實驗(含『生物晶片實作』、『基因晶片實驗技術』、『專題實驗』等)或『近代生物學實驗』至少 1 學分，以及跨生物、電子兩領域選修計 9 學分。

The required credits on this program include: (1) at least 25 credits of the required (or elective) courses listed below; (2) 12 credits of core courses, including 6 credits each from the two academic fields of biology and electronics; (3) 13 credits of advanced courses, including 2 credits of Biochip Technology or Biochips & Biosensors, at least one credit of bioelectronics related lab (such as Biochip Lab, Gene Chip Technology Lab, Special Topic Lab, etc.) or Modern Biology Lab, and 9 credits of electives in both the fields of biology and electronics.

### 學分學程課程規劃表 Program Curriculum

一、學程名稱：生物電子(Program of Bioelectronics)

Name of the Program: Bioelectronics Interdisciplinary Program

二、課程名稱及開課系所： Courses and the departments which offer the courses:

必修核心課程 12 學分 Required 12 credits on core courses

	Course	Credit	requirement	Department	Note
生物 核心 課程 Core courses (Biology)	近代生物學導論、有機化學(包括有機化學一、二或三) Int. of Current Biology、Organic Chemistry (including Organic Chemistry (I) or (III))	6	四選一 共計 6 學分 take one from the four sets of courses(a total of 6 credits)	生科系所及理學院 Dept.of Biological Science & Technology	非生科專業學生建議優先選讀此三組學科之課程。 For students who are not major in biology, it is recommended to take one of these three sets of courses firstly.
	基因體及蛋白質體簡介、有機化學(包括有機化學一、二或三)Int. to Genomics and Proteomics、Organic Chemistry (including Organic Chemistry (I)、(II) or (III))	6		College of Science	
	近代生物學(一)、(二) Modern Biology (I) & (II)	6		電子工程系所 Dept. of Electronics and Engineering	
	普通生物學(一)、(二) General Biology(I)、(II)	6		生科系所 Dept. of Biological Science & Technology	
電子	電子學(一)(二) Electronics (I) & (II)	6	左列課程任	Any department/institute	

核心 課程 Core courses (Electronic s)	應用電子學、高等電子學 Applied Electronics Advanced Electronics	6	選 6 學分 take one from the four sets of courses (a total of 6 credits)	機械工程系所 Dept. of Mechanical Engineering
	電磁學(一)、(二) Electromagnetics (I) & (II)	6		Any department/institute
	光學概論(一)、(二) Introduction to Optics (I) & (II)	6		電子物理系所 Dept. of Electrophysics

必修進階課程 13 學分 Required 13 credits on advanced courses:

	Course	Credit	requirement	Department	Note
生物 進階 課程 Advanced courses (Biology)	生物化學 (一) Biochemistry (I)	3	跨兩領域 選修至少 9 學分 at least 9 credits of electives in both fields	生科等系所及應化系 Dept. of Biological Science and Technology  Dept. of Applied Chemistry	
	生物化學 (二) Biochemistry (II)	3			
	微生物學 Microbiology	3			
	細胞生物學 (一)、(二) Cell Biology (I) & (II)	4			
	生化工學導論 Introduction of Biochemical Engineering	3			
	酵素及蛋白質工程學 Enzyme and Protein Engineering	3			
	生物合成與工程學 Biosynthesis and Bioengineering	3			
	生物有機化學 Bioorganic Chemistry	3			
	生理學 Anatomical Physiology	3			
	分析化學 Analytical Chemistry	3			
	分子生物學 Molecular Biology	3			
	病毒學 Virology	3			
	基因晶片之應用 Application for Gene Chips	3			
	電子 進階 課程 Advanced courses (Electronics)	半導體工程、或半導體製程 Semiconductor Engineering or Semiconductor Processing			
半導體元件物理、或固態電子元 件 Semiconductor Device Physics or Solid State Electronic Devices		3			
光電概論、光電子學、或光電半 導體物理及元件 Electro-Optics Science、Optical Electronics, or Semiconductor Optoelectronic Devices and Physics		3			
感測與介面 或微感測器原理與應用 Sensors and Interfacing or		3			
				電機、資訊學院及 理、工學院各系所 Colleges of Electrical & Computer Engineering, Computer Science, Science, and Engineering	
				電機與控制工程系所 Dept. of Electrical & Computer Engineering	

	Introduction to Microsensors: Principle Application			Institute of Electrical and Control Engineering
	微機電系統概論 Introduction to Micro Electro Mechanical System	3		機械工程系所 Dept. of Mechanical Engineering
	生物感測器概論 Introduction to Biosensors	3		各系所 Any department/institute
共同 進階 課程 Common Advanced courses	生物晶片技術 Biochip Technology、或生物晶片與感測器 Biochips and Biosensors	2	左列課程 任選一門 take one from the two courses	各系所合開 Joint courses offered by related departments / institutes
	生物電子相關實驗 (含生物晶片 實作、基因晶片實驗技術、專題 實驗等)、近代生物學實驗 Bioelectronics related Labs(including Biochip Lab、 Experiments for Gene Chips、 Research)、Laboratory of Modern Biology	1-3	左列課程 任選一門 take one Bioelectron ics related Lab	各系所合開 Joint courses offered by related departments / institutes

三、召集人姓名：袁俊傑 (生物科技系)、\_\_\_\_\_ (電子工程系)。

Coordinators: Prof. Chiun-Jye Yuan (Dept. of Biological Science and Technology)  
 \_\_\_\_\_ (Dept. of Electronics Engineering)

四、聯絡人姓名：賴美伶 (生物科技系)、\_\_\_\_\_ (電子工程系)。

Contact: Ms. Meiling Lai (Dept. of Biological Science and Technology)  
 \_\_\_\_\_ (Dept. of Electronics Engineering)