國立陽明交通大學生命科學系暨基因體科學研究所
跨域學程實施要點

113.03.25生命科學系暨基因體科學研究所課程委員會議通過
113.04.12生命科學院課程委員會議通過
113.05.20校課程委員會議通過
113.10.08生命科學系暨基因體科學研究所課程委員會議修訂通過
113.10.11生命科學院課程委員會議通過
113.11.25校課程委員會議通過
114.03.31生命科學系暨基因體科學研究所課程委員會議修訂通過
114.04.11生命科學院課程委員會議通過
114.05.12校課程委員會議通過
114.10.02生命科學系暨基因體科學研究所課程委員會議修訂通過
114.10.17生命科學院課程委員會議通過
114.11.12校課程委員會議通過

一、依據國立陽明交通大學跨域學程實施辦法，為鼓勵大學部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 to expand second specialty.

二、生醫與基因體科學跨域學程(以下簡稱本學程)係由生命科學系暨基因體科學研究所(以下簡稱本系)訂定之模組課程，模組課程包含「基礎核心」、「進階核心」、「專業領域」、「專業選修」四大類別科目，總學分數需達 28 學分(含)以上。本學程必選修課程與學分列示於「生命科學系暨基因體科學研究所跨域模組課程外系學生必選修科目表」。

II. The Biomedical and Genome Sciences Program is the cross-disciplinary module curriculum provided by Department of Life Sciences and Institute of Genome Sciences in National Yang Ming Chiao Tung University (hereinafter referred to as Our Department). The modular curriculum includes four categories of subjects: "Basic Core", "Advanced Core", "Professional Field" and "Professional Electives". The total credits will be based on 28 credits. The list of required electives for this program is shown in “The required and elective courses list for the students study cross-disciplinary module curriculum in Biomedical and Genome Sciences Program”.

三、外系學生欲選擇本系做為跨域專長者，得於每學年度公告申請期限內向所屬學系提出申請修習跨域學程，並經本系審核通過，其修習本系模組課程學分，是否得列計所屬學系選修課程學分數，由學生所屬學系認定。前述學生完成所屬學系畢業應修課程及學分數，並符合本系跨域學程規定課程，可於畢業證書上加註第二專長模組課程「生醫與基因體科學」為跨域專長。

III. Students in other departments who would like to study cross-disciplinary program and choose

Biomedical and Genome Sciences 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 our department. Whether the credits earned by students from the module courses can be counted toward the elective course credits of their own department is subject to the recognition of the student's department. Students who complete all program requirements are granted to add "Biomedical and Genome Sciences" as their cross-disciplinary specialty on the diploma.

四、本系學生修習跨域學程須經本系以及第二專長的系所或學院申請通過，修習跨域學程的畢業學分數以128學分為原則，其所需修習的課程與學分列示於「生命科學系暨基因體科學研究所學生修讀其他跨域學程必修科目表」，包含：校共同必修、本系必修課程、以及第二專長模組課程(認定為跨域專長)，並於畢業證書上加註第二專長模組課程為「跨域專長」。

IV. Students in our department who would like to take other cross-disciplinary programs must apply for approval from both our department and the department or college of their second specialty. The total number of credits for graduation is at least 128. The courses and credits required are shown in " The Required courses list for the students at our department who study other cross-disciplinary program". The courses include required courses of the university , required courses of our department , and the cross-disciplinary module curriculum of the second specialty department or college. The module curriculum of the second specialty could be remarked as "Cross-Disciplinary Specialty" on the diploma.

五、修讀本系跨域學程學生在申請通過前已修習及格之科目學分，若合於第二專長模組課程應修課程學分，得經本系審查同意後，予以追加採認。

V. The credits of cross-disciplinary program module curriculums obtained before the student has been admitted to take the cross-disciplinary program can be counted if the credits are recognized by our department.

六、修讀跨域學程學生之選課手續應於加退選期限內完成，且每學期所修本系模組課程科目、學分及成績均列記於歷年成績表內。

VI. Students taking a cross-disciplinary program shall enroll courses of the program by the deadlines of course registration. The courses, credits, and grades of the cross-disciplinary program module curriculums should be listed in the annual transcripts in each semester.

七、學生之第二專長模組課程學分及成績分別併入學期修讀學分總數及學期平均成績計算。

VII. The courses, credits, and grades of cross-disciplinary program are incorporated into the student's semester credits and average grade.

八、修讀跨域學程學生，擬終止修讀跨域學程者，應至教務處申請撤銷其跨域學程資格，

並回復至所屬學系修課規定。其已修習及格之第二專長模組課程學分，經所屬學系核定，報教務處備查後得抵免其所屬學系選修課程學分。

VIII. Students taking a cross-disciplinary program and intending to terminate the study in the cross- disciplinary program shall register with the Office of Academic Affairs for withdrawal from the program and follow the regulations and requirements of major department. The passed courses of the cross-disciplinary program can be used as credit waiver against the core courses of the major with the approval of the Major department. The approval should be submitted to the Office of Academic Affairs for archiving purposes.

九、本學程召集人由系主任擔任，由學程召集人指定一名專任教師擔任跨域學程導師，專責輔導跨域學程的學生。

IX. The Convenor of the Program is the Director of the Department. The convener of the program will designate a full-time teacher to serve as a cross-disciplinary program tutor, who is responsible for tutoring cross-disciplinary program students.

十、本要點如有未盡事宜，悉依本校學則及其他相關規定辦理。

X. 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.

十一、本要點經系、院、校級課程委員會通過後實施，修訂時亦同。

XI. These guidelines were approved by Curricular Committee at the university level before putting it into practice; the same shall be done upon any amendment thereto.

生命科學系暨基因體科學研究所學生修讀其他跨域學程必修科目表

The Required courses list for the students at our department who study other cross-disciplinary program

類別	科目名稱	學分數	開課單位	備註
本系必修課程 (最低65學分)	微積分(一)(二) Calculus(I)(II)	4	生科系基因體所	生物醫學科學組： 「*」課程至少選修3門，6學分。 生醫光電與資訊組： 「●」課程至少選修3門，6學分。
	普通物理學(一)(二) General Physics I/II	4	物治輔具系	
	生命科學總論(上)(下) General Biology, 1st, 2nd semester	4	生科系基因體所	
	化學原理(一)(二) Principles of Chemistry I/II	4	生科系基因體所	
	有機化學 Organic Chemistry	3	生化科	
	計算機概論 Introduction to Computer Science	2	生醫資訊所	
	抽象思考與演算法 Abstraction and Algorithms	2	生醫資訊所	
	模擬系統與數據分析 Simulation Models and Data Analysis	2	生醫資訊所	
	量化數據分析 Quantitative data analysis	2	生醫資訊所	
	生物化學 Biochemistry	4	生科系基因體所	
	細胞生物學 Cell Biology	2	生科系基因體所	
	生理學 Physiology	3	生科系基因體所	
	生物統計學 Introduction to Biostatistics	2	生科系基因體所	
	研究室實務訓練 Laboratory Practical Training	2	生科系基因體所	
	*●發育生物學 Developmental Biology	3	生科系基因體所	
	*●結構生物學(一) Structural Biology I	2	生科系基因體所	
	*●遺傳學概論 Introductory Genetics	3	生科系基因體所	
	*●生物資訊學 Introduction to Bioinformatics	2	生醫資訊所	
	*●神經生物學 Neurobiology	3	神研所	
	*●基礎免疫學 Basic Immunology	2	生科系基因體所	
	*●生物學特論(一) Honor Biology I	2	生科系基因體所	

	*●生物學特論(二) Honor Biology II	2	生科系基因體所	
	*●演化遺傳學與醫學 Evolutionary Genetics and Medicine	2	生科系基因體所	
	*●基因分子生物學 Molecular Biology of the Gene	3	生科系基因體所	
	●工程數學 Engineering Mathematics	3	生醫光電所	
	●線性代數 Linear Algebra	3	生醫光電所	
	科學文獻研讀與分析(上) Scientific literature reading and analysis I	2	生科系基因體所	
	科學文獻研讀與分析(下) Scientific literature reading and analysis II	2	生科系基因體所	
	論文閱讀與分析方法(上) Paper Reading and Analysis, 1st semester	1	生科系基因體所	
	論文閱讀與分析方法(下) Paper Reading and Analysis, 2nd semester	1	生科系基因體所	
	生命科學實驗 Life Science Laboratory	2	生科系基因體所	
	化學原理實驗 Chemical Principle Lab	1	生科系基因體所	
	遺傳學原理的實作與應用 Laboratory in Fundamental Genetics and its Applications	2	生科系基因體所	
	物理學實驗 Physics Laboratory	1	生科系基因體所	
	有機化學實驗 Laboratory in Organic Chemistry	1	生科系基因體所	
	生化及細胞生物學實驗 Biochemistry & Cell Biology Laboratory	2	生科系基因體所	
	生涯發展與學習(一上) Career Development and Preparation II, 1st Semester	1	生科系基因體所	
	生涯發展與學習(一下)-基礎服務學習 Career Development and Preparation I, 2nd Semester - Foundational Service Learning	1	生科系基因體所	
	生涯發展與學習(二上)-基礎服務學習 Career Development and Preparation II, 1st Semester - Foundational Service Learning	1	生科系基因體所	
	生涯發展與學習(二下) Career Development and Preparation II, 2nd Semester	1	生科系基因體所	
其他跨域學程	本校各系所或學院所提供之跨域模組學程，擇一修畢。			至少28學分
最低畢業學分128學分 (含校共同必修24學分)				

生醫與基因體科學跨域模組課程**外系**學生必選修科目表

The required and elective courses list for the students study cross-disciplinary module curriculum in Biomedical and Genome Sciences Program

課程類別		課程名稱	學分	備註	最低
必修 基礎核心 (三選二)	生物	生命科學總論(上) General Biology, 1st semester	2		4
		生命科學總論(下) General Biology, 2nd semester	2		
		普通生物學(上) General Biology I	2	雙邊遠距	
		普通生物學(下) General Biology II	2	雙邊遠距	
		生物學 Biology	3		
		普通生物學 General Biology	3		
	化學	化學原理(一) Principles of Chemistry I	2		
		化學原理(二) Principles of Chemistry II	2		
	資訊	計算機概論 Introduction to Computer Science	2		
		抽象思考與演算法 Abstraction and Algorithms	2		
必修 進階核心 (三選二)	生物	細胞生物學 Cell Biology	2		5
		分子細胞生物概論 Molecular & Cell Biology	2		
		生理學 Physiology	3		
		生理學 Physiology	2	英文授課	
	化學	有機化學 Organic Chemistry	3		
		生物化學 Biochemistry	4		
	分析	模擬系統與數據分析 Simulation Models and Data Analysis	2		
		量化數據分析 Quantitative data analysis	2		
		生物統計學 Introduction to Biostatistics	2		
必修 專業領域 (五選二)	總整	健康與疾病通論 General concepts of health and diseases	2	雙邊遠距	6
		生物學特論(一) Honor Biology I	2		
		生物學特論(二) Honor Biology II	2		
	分子遺傳	基因分子生物學 Molecular Biology of the Gene	3		
		遺傳學概論 Introductory Genetics	3		
		演化遺傳學與醫學	2	英文授課	

		Evolutionary Genetics and Medicine			
		表觀遺傳學概論 Epigenetics and chromatin	1	英文授課	
	組織系統	發育生物學 Developmental Biology	3		
		神經生物學 Neurobiology	3		
		基礎免疫學 Basic Immunology	2		
		癌症生物學 Cancer Biology	3		
	藥物結構	結構生物學(一) Structural Biology I	2		
		結構生物學(二) Structural Biology II	2		
		藥物化學概論 An introduction to medicinal chemistry	2		
	資訊工程	生物資訊學 Introduction to Bioinformatics	2		
		工程數學 Engineering Mathematics	3		
		線性代數 Linear Algebra	3		

課程類別		課程名稱	學分	備註	
專業選修	細胞	幹細胞與再生 Stem Cells and Regeneration	2	英文授課	
		細胞骨架力學 Cytoskeletal mechanics	2		
		跨領域科學在細胞移動之研究 Multidisciplinary approaches for cell migration	1		
		生物影像分析在細胞生物學的應用 Applications of Image Analysis in Cell Biology	3		
		細胞訊息傳導與疾病 Signal transduction and diseases	2		
	神經	神經生理學 Neurophysiology	2		
		腦結構與功能 Structure and Function of the Brain	3		
		系統神經科學:腦與行為 Systems Neuroscience: Brain and Behavior	2		
		學習與記憶導論 Introduction of Neurobiology of Learning and Memory	2		
		模式生物與腦科學 Model Organisms in Neuroscience	2		
	結構	蛋白質化學 Protein chemistry	2		
		核磁共振光譜學 NMR spectroscopy	2		
	藥物	分子模擬與藥物設計的概論與應用	2		

		Molecular modeling and computer-aided drug design: Principles and Applications		
		藥理學 Pharmacology	2	
	微免	免疫學(全英語) Immunology (in English)	2	
		病毒學 Virology	2	
		細菌叢與人類疾病 Microbiota and Human Diseases	2	
	多體學	多體學：從原理到分子醫學之應用 Multi-Omics: Principles and Applications in Molecular Medicine	2	
		微生物體學概論 Introductory Microbiome	2	
		高等蛋白質體學 Advanced Proteomics	2	
		化學生物學-蛋白體與代謝體研究方法 Chemical Biology-Proteomics and metabolomics approaches	1	
	資訊	生物統計學實習與R語言的運用 Biostatistics in Practice using R Language	1	
		生物醫學資訊學基礎(一) Foundations for Biomedical Informatics I	2	
		生物醫學資訊學基礎(二) Foundations for Biomedical Informatics II	2	
	整合	老化生物學:基礎概論及轉譯醫學 The Biology of Aging: Concepts and Translational Medicine	2	
		當合成生物學遇見諾貝爾獎 Synthetic Biology x Nobel Prizes	2	英文授課
		小鼠遺傳、發育與表現型分析 Mouse Genetics, Development and Phenotypes	2	
		科學文獻研讀與分析(上) Scientific literature reading and analysis I	2	
		科學文獻研讀與分析(下) Scientific literature reading and analysis II	2	
	實作	生命科學實驗 Life Science Laboratory	2	
		遺傳學原理的實作與應用 Laboratory in Fundamental Genetics and its Applications	2	
		生化及細胞生物學實驗 Biochemistry & Cell Biology Laboratory	2	
		普通生物學實驗 Laboratory Studies of Biology	2	
		生物學實驗 General Biology Lab	2	
		研究室實務訓練 Laboratory Practical Training	2	限選擇生科系基因體所教師實驗室
		專題研究(一)(二)(三)(四) Research on Special Topics I/II/III/IV	2	限選擇生科院教師實驗

				室，可擇一修習	

說明：

1.「生醫與基因體科學」跨域學程修習總學分數需達 28 學分(含)以上。

2. 基礎核心與進階核心課程於原/他系修畢且不屬於原系之必修學分得認列。

3. 承2，若屬原系必修學分則不得認列，但仍可計為本學程之三選二項目，學分數以列表中其他課程來補足。