

國立陽明交通大學應用數學系跨域學程實施要點

National Yang Ming Chiao Tung University

Cross-Disciplinary Program Implementation Regulations

110/12/02, 112/05/16, 115/05/14 修訂

- 一、依據國立陽明交通大學跨域學程實施辦法，國立陽明交通大學應用數學學系(以下簡稱本系)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情況下，修畢跨域學程，特訂定本實施要點。

Article One These Implementation Guidelines are prescribed by National Yang Ming Chiao Tung University Department of Applied Mathematics (hereinafter referred to as Our Department) based on NCTU NYCU Cross-Disciplinary Program Implementation Regulations to provide the opportunity for students to proceed cross-disciplinary learning without increasing graduate 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、依據國立陽明交通大學跨域學程實施辦法，跨域學程係指由陽明交通大學的學系、研究所、或學院提出模組課程，模組課程應包含該領域基礎核心知識，且總學分數以 30 學分為原則(最低可為 28 學分，最高不可超過 32 學分)，學生修習跨域學程，其課程將包含所屬學系的跨域學程模組課程以及第二專長系所或學院的跨域學程模組課程，並可於畢業證書上加註第二專長模組課程為「跨域專長」。

Article Two The cross-disciplinary program here means the cross-disciplinary module curriculum proposed by the departments, institutes or colleges in National Yang Ming Chiao Tung University. Module curriculum should include the core knowledge curriculum of the field and the total credits will be based on 30 credits (with a minimum of 28 credits and no more than 32 credits). The cross-disciplinary program that students take will include the cross-disciplinary program module curriculum of the department they belong to as well as the cross-disciplinary program module curriculum from the second specialty department or college. The module curriculum of the second specialty could be remarked as “Cross-Disciplinary Specialty” on the diploma.

三、本要點實施對象

Article Three Implementation objects of these Guidelines

1. 凡本校 104 學年度(含)之後入學之學士班學生均適用本實施要點。

1. The implementation guidelines are applicable to the students in 104th academic year or thereafter.

2. 本系學生欲修習跨域學程者

2. For the student of our department who would like to take cross-disciplinary program

- (1) 得於每學年度公告申請期限內檢附申請表及其他相關資料內向本系提出申請，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。

(1) The application should be submitted to our department before the application deadline, which will be announced annually by our department. The application should be sent to the department or college of the second specialty for evaluation after it is approved by the Curricular Committee of our department. Students could only take the cross-disciplinary program after successful evaluation by both sides.

- (2) 本系學生修習跨域學程的課程，列示於「應用數學學系跨域學程本系學生必修科目表」，其課程包含：校必修、本系基礎必修課程、本系跨域模組課程、以及第二專長系所或學院的跨域模組課程(以下簡稱他系跨域模組課程)，畢業學分以 128 學分為原則。他系跨域模組課程認定為跨域專長，於畢業證書本系名稱後加註此跨域專長。

(2) The courses of cross-disciplinary program studied by students in our department should be listed on “The Required Course List (A)” These courses include required courses of the university core curriculum at our department, cross-disciplinary module curriculum at our department, and the cross-disciplinary module curriculum of the second specialty department or college (hereinafter referred to as cross-disciplinary module curriculum at other department) with at least 128 graduate credits. The cross-disciplinary module curriculum at other department would be recognized as cross-disciplinary specialty, and it will be remarked after the title of our department on the diploma.

- (3) 本系學生修習跨域學程，若無法修畢跨域學程課程，得選擇放棄跨域學程，改修習原本學系的學士學位課程。

(3) For students at our department who study for cross-disciplinary program but are not able to complete the program, they shall give up the cross-disciplinary program and transfer to study for the bachelor degree program at the original department.

3. 外系學生欲修習跨域學程且選擇本系做為其跨域專長者

3. For students of other departments who would like to study for cross-disciplinary program and choose our department as their cross-disciplinary specialty

- (1) 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，通過原系以及本系的雙邊審查後，方可進入跨域學程。
- (1) The application should be submitted to our department before the application deadline, which will be announced annually by our department. The application should be sent to the department or college of the second specialty for evaluation after it is approved by the Curricular Committee of our department. Students could only take the cross-disciplinary program after successful evaluation by both sides.
- (2) 外系學生修讀跨域學程且選擇本系做為其跨域專長者，其課程包含：校必修、原系基礎必修課程、原系跨域模組課程、以及列示於「應用數學學系跨域模組課程必修科目表」的模組課程，畢業學分以 128 學分為原則，並於畢業證書原系名稱後加註應用數學為其跨域專長。
- (2) The courses for the students of other departments who would like to study for cross-disciplinary program and choose our department as their cross-disciplinary specialty include required courses of the university-core curriculum at their original department, cross-disciplinary module curriculum at their original department, and the module curriculum listed on “The Required Course List (B)” with at least 128 graduate credits. Applied Mathematics will be remarked as their cross-disciplinary specialty after the title of their original department on the diploma.

四、本系至少指定一名專任教師擔任跨域學程導師，統籌執行學程各項事宜，專責輔導跨域學程學生。
Our department will assign at least one full-time teacher to be the mentor of the students enrolled in the cross-disciplinary study program. The mentor provides guidance/assistance to the students of the cross-disciplinary study program.

五、修讀跨域學程學生在獲核准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，得經第二專長的系所或學院審查同意後，予以追加採認。
The credits of cross-disciplinary program module curriculums obtained before the student has been admitted to take the cross-disciplinary program can only be counted if the credits are recognized by the department or college of the second specialty.

六、修讀跨域學程學生凡符合跨域學程規定畢業者，其畢業生名冊、歷年成績表及學位證書應加註跨域專長名稱。但畢業時如尚未修滿跨域學程規定之科目與學分，不得申請發給有關跨域學程之任何證明。
For students who earn sufficient credits and meet the requirements of the cross-disciplinary program, the department of the cross-disciplinary program will be noted in the graduates roster, transcripts, and diplomas, otherwise, no certificate of the cross-disciplinary program will be issued.

七、本要點如有未盡事宜，悉依本校學則及其他相關規定辦理。
Article Five 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.

八、本要點由本系課程委員會訂定，依序經院及校課程委員會審查通過後實施，修訂時亦同。
Article Seven These guidelines were designated by Curricular Committee at department level, approved by Curricular Committee at college and university before putting it into practice; the same shall be done upon any amendment thereto.

應用數學系跨域學程 本系學生 必修科目表(A)

The Required Course List (A) for the students in Department of Applied Mathematics applying for cross-disciplinary program.

類別 Category	科目名稱 Course Name	學分 Credit	開課系所 Department	備註 Remark	
本系基礎必修（36 學分） Core curriculum at our department （36 credits）	微積分（一）（二） Calculus(I)(II)	8	應用數學系 Department of Applied Mathematics	必修 Required course	
	線性代數（一）（二） Linear Algebra(I)(II)	6			
	計算機概論（一）（二） Introduction to Computer Science(I)(II)	6			
	物理（一）（二） Physics(I)(II)	8			
	分析導論（一）（二） Introduction to Analysis(I)(II)	8			
	本系跨域模組之基礎學科課程 （20 學分） Cross-disciplinary modules at our department （20 credits）	向量微積分 Vector Calculus			2
		微分方程 Differential Equations			3
機率論 Probability Theory		3			
計算數學 Computational Mathematics		3			
代數學（一） Algebra(I)		3			
離散數學 Discrete Mathematics		3			
偏微分方程導論 Introduction to Partial Differential Equations		3			
統計學 Statistics		3			
複變函數論 Complex Analysis		3			
本系其它選修課程至少 10 學分 At least 10 credits from elective courses at our department					
他系跨域模組（28-32 學分） Cross-disciplinary modules at other department （28-32 credits）	本校各系所或學院所提供之跨域模組學程，擇一修畢 The cross-disciplinary modules offered by departments or colleges at our university; choose one to complete.				
最低畢業學分 Minimum Graduate Credits		128	校共同必修：依學校共同課程通則辦理。 Intercollegiate compulsory courses in general education: follow the regulations for general education courses of the university.		

應用數學學系 跨域模組課程 必修科目表(B)

The Required Course List (B) in cross-disciplinary module curriculum of Applied Mathematics for the students of other departments

類別 Category	科目名稱 Course Name	學分 Credit	開課系所 Department	備註 Remark
基礎學科 Basic Course	向量微積分 Vector Calculus	2	應用數學系 或經本系課程 委員會認定同 意 Department of Applied Mathematics Or be approved by the Curriculum Committee	左列課程或 本系所開之 專業選修課 程至少 28 學 分 At least 28 credits for the courses listed on the left or elective courses offered by the department
	線性代數（一） Linear algebra (I)	3		
	線性代數（二） Linear algebra (II)	3		
	微分方程 Differential Equations	3		
	偏微分方程導論 Introduction to Partial Differential Equations	3		
	機率論 Probability Theory	3		
	代數學（一） Algebra(I)	3		
	離散數學 Discrete Mathematics	3		
	計算數學 Computational Mathematics	3		
	統計學 Statistics	3		
	分析導論（一）(高等微積分(一)) Introduction to Analysis (I) (Advanced Calculus (I))	4		
	分析導論（二）(高等微積分(二)) Introduction to Analysis (II) (Advanced Calculus (II))	4		
	複變函數論 Complex Analysis	3		
進階選修 Advanced Course	實分析導論 Introduction to Real Analysis	3		
	拓撲學 Topology	3		
	幾何學 Geometry	3		
	動態系統導論 Introduction to Dynamic Systems	3		
	代數學（二） Algebra(II)	3		
	基礎數論 Basic Number Theory	3		
	機率建模 Probability Modeling	3		
	隨機過程 Stochastic Process	3		

	高等機率論(一) Advanced Probability (I)	3		
	資料結構與圖論演算法 Data structure and Graph Algorithms	3		
	基礎圖論 Basic Graph Theory	3		
	圖論 Graph Theory	3		
	編碼理論 Coding Theory	3		
	密碼學 Cryptography	3		
	應用數學方法 Applied Mathematics Methods	3		
	科學計算導論 Introduction to Scientific Computing	3		
	大型矩陣計算 Large Sparse Matrix Computations	3		
	最佳化理論方法及應用 Optimization: Theory, Algorithms and Applications	3		
	數值偏微分方程 Numerical Partial Differential Equations	3		
	機器學習 Machine Learning	3		
應用/總整選修 Applied/Integrative Course	主題式數學建模與計算(一) Topical Mathematical Modeling and Computing(I)	3		
	主題式數學建模與計算(二) Topical Mathematical Modeling and Computing (II)	3		
	專題研究* Directed Individual Study	3		

註：專題研究(一)~(四)至多採計 6 學分

Directed Individual Study (1) (2) (3) (4) At most six credits from Directed Individual Study courses.