

國立交通大學物理研究所跨域學程實施要點
Guidelines of the Cross-Disciplinary Program
Institute of Physics, National Chiao-Tung University

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第一條 依據國立交通大學跨域學程實施辦法，國立交通大學物理研究所(以下簡稱本所)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。

Article One These Guidelines are prescribed by National Chiao Tung University Institute of Physics (hereinafter referred to as Our Institute) based on NCTU Cross-Disciplinary Program Implementation Regulations to provide the opportunity for students to access cross-disciplinary learning without increasing graduate credits (or only a few extra credits) in order to encourage students to conduct cross-disciplinary study, establish the depth of cross-disciplinary study, and assist students to own the other specialty.

第二條 依據國立交通大學跨域學程實施辦法，跨域學程係指由本所提出模組課程，模組課程包含物理領域基礎核心知識，且總學分數以30學分為原則，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本所第二專長跨域學程模組課程，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 designed by Our Institute. Module curriculum should include the core knowledge curriculum of Physics and the total credits will be 30 credits. The cross-disciplinary program will include the cross-disciplinary program module curriculum of the department they belong to as well as the cross-disciplinary program module curriculum from Our Institute for the second specialty. The module curriculum of the second specialty could be remarked as “cross-disciplinary specialty” on the diploma.

第三條 本辦法實施對象

1. 凡本校學士班學生均適用本辦法。
2. 外系學生欲修習跨域學程且選擇本所做為其跨域專長者
 - (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，通過原系以及本所的雙邊審查後，方可進入跨域學程。
 - (2) 外系學生修讀跨域學程且選擇本所做為其跨域專長者，其課程包含：校必修(含共同必修28學分)，原系基礎必修課程，原系跨域模組課程，以及列示於『物理研究所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物理為其跨域專長。
 - (3) 跨域模組課程與學生本系應修課程及學分重複者，由本所指定之相關選修課程補足。

Article Three Subjects of these Guidelines:

1. These Rules apply to all bachelor program students admitted by NCTU.
2. For students of other departments who would like to take the cross-disciplinary program and choose

Our Institute as their cross-disciplinary specialty.

- (1) Students could submit the application to the department that they belong to within the period announced annually by university; students could only take the cross-disciplinary program after approved by both their original department and our institute.
- (2) The courses for students of other departments who would like to take the cross-disciplinary program and choose Our Institute as their cross-disciplinary specialty include compulsory courses of the university (including 28 credits of common compulsory subjects), core curriculum at their original department, cross-disciplinary modules at their original department, and the modules listed on “The compulsory course list for the students study cross-disciplinary program module curriculum in Institute of Physics” with at least 128 graduate credits. “Physics” will be remarked as their cross-disciplinary specialty after the title of their original department on the diploma.
- (3) **If the credits of the cross-disciplinary program module curriculum are the same with those of the required courses at the Major department, the duplication must be made up with the elective courses related to the specialty appointed by Our Institute.**

第四條 本所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。

Article Four Our Institute should assign at least one of full-time faculty to be the mentor of the cross-disciplinary program and form mentor group with teachers of cross-disciplinary program at other departments or colleges to give guidance to cross-disciplinary program students.

第五條 為鼓勵不同系所或學院合作提出跨域共授課程，兩位以上教師開授跨領域之創新整合式課程，得依本校教師授課鐘點核計原則第9條第6款規定，教師的授課鐘點數可按到場時數計，但以開課前該門課程實際簽呈為依據。

Article Five In order to encourage different departments or colleges working together for the proposal of cross-disciplinary curriculum, the number of teaching hours for the innovating integrated curriculum offered by more than two teachers could be calculated by the actual time of teaching according to Subparagraph 6, Article 9 of Teaching Hours Accounting Principle; however, it will be in accordance with the approval of the curriculum before the course starts.

第六條 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 Six If there are other matters not described in these guidelines; it shall be handled in accordance with the school constitution of our university as well as other relevant regulations.

第七條 本要點經本所務會議通過，所屬學院課程委員會及校級課程委員會審查，再送教務會議核備後實施，修訂時亦同。

Article Seven These guidelines were approved by the Institute affairs meeting, reviewed by the curriculum committee at both college and university levels and submitted to academic affairs meeting for approval and reference before putting it into practice; the same shall be done upon any amendment thereto.

物理研究所跨域模組課程必修科目表 (B) The Compulsory Course List for Cross-Disciplinary Program in Institute of Physics (B)

類別 Category	科目名稱 Name of course	學分 Credits	開課系 所 Offered by	備註 Remark
本所跨域模組 (30 學分) Cross-disciplinary program module curriculum at Our Institute (30 credits) 修畢於畢業證書加註『跨域專長：物理』 It could be remarked as “Cross-disciplinary Specialty: Physics” on the diploma after the module curriculum is completed.	第一階段 Stage 1 右列四擇一 Choose one out of the four from the right 詳見備註 See remarks	物理數學(一)/物理數學(二) Mathematical Physics (I) / Mathematical Physics (II)	3/3 物理所 IOP	1. 來自工數、應數非必修的科系。 From a department where Engineering Mathematics and Applied Mathematics are not compulsory courses.
		應用數學(一)/應用數學(二) 或微積分之外的 2 學期數學相關課程 Applied Mathematics (I) / Applied Mathematics (II) or two engineering mathematic courses above calculus	3/3 電物系 DEP 工學院 COE 電機學院 ECE	
		近代物理(一)/近代物理(二)/ <u>*核心課程/*核心課程</u> (4 門課中擇 2 修習) Modern Physics (I) / Modern Physics (II) / *core curriculum / *core curriculum (choose two out of four)	3/3 物理所 IOP	1. 來自工數、應數為必修的科系與應數系學生。 Students from a department where Engineering Mathematics or Applied Mathematics are compulsory courses. From Department of Applied Mathematics. 2. 修過電物系近代物理(一)(二)得申請抵免。 A credit waiver may be granted for students who have taken Modern Physics (I) and (II) in the Department of Electrophysics.
		<u>近代物理(一)/近代物理(二)/物理化學(二)/<u>*核心課程</u></u> <u>(4 門課中擇 2 修習)</u> <u>Modern Physics (I) / Modern Physics (II) / Physical Chemistry (II) / *core curriculum</u> <u>(choose two out of four)</u>	3/3 <u>物理所 IOP</u>	1. <u>來自生科系與應化系學生。 From Department of Biological Science and Technology and Department of Applied Chemistry.</u> 2. <u>修過電物系近代物理(一)(二)、生科系物理化學(二)得申請抵免。 A credit waiver may be granted for students who have taken Modern Physics (I) & (II) in the Department of Electrophysics and Physical Chemistry (II) in Department of Biological Science and Technology.</u>
必修	經典物理(一)/經典物	3/3	物理所	力學、電磁學、 <u>熱力學</u> 、特殊相對

		compulsory courses	理(二) Classical Physics (I) / Classical Physics (II)		IOP	論等 Mechanics, Electromagnetics, <u>Thermodynamics</u> , Special Relativity
第二階段 Stage 2	右列 二擇一 Choose one out of the two from the right	詳見備 註 See remar ks	量子力學(一)/量子力 學(二) Quantum Mechanics (I) / Quantum Mechanics (II)	3/3 3/3	物理所 IOP	1. <u>來自工數、應數非必修的科系。From a department where Engineering Mathematics and Applied Mathematics are not compulsory courses.</u> 2. <u>來自工數、應數為必修的科系與應數系學生。Students from a department where Engineering Mathematics or Applied Mathematics are compulsory courses. From Department of Applied Mathematics.</u>
			進階實驗(一)/ <u>*核心課程</u> 或 進階實驗(一)/(二) Advanced Lab (I)/ <u>*core curriculum</u> or Advanced Lab (I)/(II)			
			<u>生物物理學/非平衡統計專題</u> <u>Biophysics/ Topics in Non-Equilibrium Statistics</u> <u>原子分子物理(一)/統計力學(一)</u> <u>Atomic Molecular Physics (I)/ Statistical Mechanics (I)</u>	3/3 3/3	<u>物理所</u> <u>IOP</u>	<u>來自生科系與應化系學生。From Department of Biological Science and Technology and Department of Applied Chemistry.</u>
第三階段 Stage 3	必修 compulsory course s		專題研究論文(一)/專 題研究論文(二) Topic Research and Thesis (I) / Topic Research and Thesis (II)	3/3	物理所 IOP	
總學分 (30 學分)			Total credits (30 credits)			

一、物理研究所跨域模組之*核心課程：統計力學(一)、固態物理(一)(二)、粒子物理(一)、電動力學(一)(二)、古典力學、量子場論(一)、原子分子物理(一)、廣義相對論、宇宙學簡介、計算物理、數值分析。

1. *Core curriculum for the cross-disciplinary program of Institute of Physics: Statistical Mechanics (I), Solid State Physics (I) and (II), Particle Physics (I), Electrodynamics (I) and (II), Classical Mechanics, Quantum Field Theory (I), Molecular Physics (I), General Relativity, Introduction to Cosmology, Computational Physics and Numerical Methods for Physics.

二、擋修(先修)規定：所有課程必須先修過基礎(一)的課程，才能再選修進階(二)的課程。

2. Prerequisite requirement: For all the courses, the fundamental course which is marked as (I) shall be taken before the advanced course which is marked as (II).