Course Structure for Ph. D Program
GPE, Department of Physics
National Taiwan Normal University

Adaptive to Class of	Required Credit(s)	Elective Credit(s)	Free Elective Credit(s)	Minimum Total Credits for Graduation
110	9.0	24.0	0.0	33.0

Note: The first alphabet ”E” on the course name refers to the course in English as a medium of instruction

I. Required Courses: 9.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
PHC0011	1 E Quantum Mechanics (I)	3.0	3.0	0.0	
PHC0012	2 E Quantum Mechanics (II)	3.0	3.0	0.0	
PHC0013	3 E Classical Electrodynamics (I)	3.0	3.0	0.0	

II. Elective Courses: 12.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
	1 Foundation elective course 9.0 credits are required,				
PHC0014	1-1 E Classical Electrodynamics (II)	3.0	3.0	0.0	
PHC0010	1-2 E Classical Mechanics	3.0	3.0	0.0	
PHC0019	1-3 E Statistical Mechanics (I)	3.0	3.0	0.0	
	2 Seminar 3.0 credits are required, Seminar (I), (II), (III), (IV) select three subjects out of four				
PHC0041	2-1 E Seminar (I)	1.0	1.0	0.0	
PHC0042	2-2 E Seminar (II)	1.0	1.0	0.0	
PHC0069	2-3 E Seminar (III)	1.0	1.0	0.0	
PHC0070	2-4 E Seminar (IV)	1.0	1.0	0.0	

III. Courses Offered to Students in Different Divisions

Required Course, 0.0 credit is required

Elective Course: 12.0 credits are required

Course Code	Course Name	Credit(s)	Credit Unit		Note
			Lecture Hour	Lab/Practice Hour	
PHC0020	1 E Statistical Mechanics (II)	3.0	3.0	0.0	
PHC0023	2 E Solid State Physics (I)	3.0	3.0	0.0	
PHC0024	3 E Solid State Physics (II)	3.0	3.0	0.0	
PHC0033	4 E Advanced Quantum Mechanics (I)	3.0	3.0	0.0	
PHC0034	5 E Advanced Quantum Mechanics (II)	3.0	3.0	0.0	
PHC0045	6 E Advanced Computational Physics (I)	3.0	3.0	0.0	
PHC0066	7 E Many - Body Physics (I)	3.0	3.0	0.0	
PHC0114	8 E General Relativity (I)	3.0	3.0	0.0	
PHC0146	9 E Quantum Field Theory	3.0	3.0	0.0	
PHC0172	10 E Advanced Principle of Optics(I)	3.0	3.0	0.0	
PHC0173	11 E Advanced Principle of Optics(II)	3.0	3.0	0.0	
PHC8016	12 E Topology in Condensed Matter Systems (I)	3.0	3.0	0.0	
PHC8017	13 E Topology in Condensed Matter Systems (II)	3.0	3.0	0.0	
PHC8015	14 E Advanced Mathematical Physics	3.0	3.0	0.0	
PHC8022	15 E Introduction to Gauge Field Theories	2.0	2.0	0.0	
PHD0007	16 E Quantum Field Theory (I)	3.0	3.0	0.0	
PHD0008	17 E Quantum Field Theory (II)	3.0	3.0	0.0	
PHD0049	18 E Advanced Surfaced Physics (I)	3.0	3.0	0.0	
PHD0050	19 E Advanced Surfaced Physics (II)	3.0	3.0	0.0	
PHC8030	20 E Topics on Two Dimensional Quantum Materials (I)	3.0	3.0	0.0	
PHC8031	21 E Topics on Two Dimensional Quantum Materials (II)	3.0	3.0	0.0	
PHC8028	22 E Principles and Applications of Atomic Force Microscopy	3.0	3.0	0.0	
PHC8032	23 E New Physics at the Large Hadron Collider	1.0	1.0	0.0	
PHC8034	24 E Field Theory of Condensed Matter Physics (I)	3.0	3.0	0.0	
PHC8035	25 E Field Theory of Condensed Matter Physics (II)	3.0	3.0	0.0	

IV. Free Elective Credits: 0.0 credit is required