Department of Physics, National Chung Cheng University

Guideline for graduation requirements (for students admitted after 2020)

I. The number of total credits needed for graduation shall be no less than 128 credits, which includes

(1) General education: 28 credits,
(2) Required credits for major in physics: group A, 61 credits; group B, 60 credits,
(3) Elective credits for major in physics: group A, 23 credits; group B, 24 credits,
(4) Free elective credits: group A, 16 credits; group B, 16 credits.

II. The curriculum		Year 1		Year 2		Year 3		Year 4	
(1) General education (28 credits)		Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
Chinese/English courses: 1. Chinese language knowledge and application (Total: 4 credits) 2. English ability training (Total: 4 credits)		2 2	2 2						
Other courses: At least one course choosing from each of the five branches (1 through 5, total of 5 courses) designated under the General Education course program. The remaining credits can be fulfilled by taking courses offered from information competence course program, general introductory course program, and all six branches under General Education course program.	★ Please refer to "Guideline for Studying General Education at National Chung Cheng University" for more information. ★ General introductory courses offered by the Department will not be counted as General Education credits. The student is remined to follow strictly the rule set by a list of "Non-Selectable General Education Courses for Each Department" where the Department lists courses not allowed to be counted as General Education credits. ★ Refer to "Guideline for Students Taking Physical Education Courses at National Chung Cheng University" for relevant information.								
Note: Social service learning course as required courses for graduation. (no credit)									
(2) Required courses for physics major (Group A, 61 credits; group B, 60 credits)									
Required courses for groups A and B	Calculus (I), (II) (Total: 8 credits)	4	4						
	General Chemistry (I), (II) (Total: 6 credits)	3	3						
	General Chemistry Laboratory (I), (II) (Total: 2 credits)	1	1						
Required courses for group A	General Physics (I), (II) (Total: 8 credits)	4	4						
	Experiments on General Physics (I) ~ (III) (Total: 12 credits)	4	4	4					
	Applied Mathematics (I), (II) (Total: 6 credits)			3	3				
	Electromagnetics (4 credits)			4					
	Modern Physics (3 credits)			3					
	Theoretical Mechanics (4 credits)				4				
	Quantum Physics (Ⅰ) (4 credits)				4				

	Thermal and Statistical Physics (4 credits)					4			
Required courses for group B	Fundamentals of Physics (I) ~ (Ⅳ) (Total: 16 credits)	4	4	4	4				
	Experiments on Fundamental Physics (I) ~ (IV) (Total: 16 credits)	4	4	4	4				
	Special Topic in Physics (I) ~ (IV) (4 credits needed for graduation.)					2	2	2	2
	Literature study and term paper writing (I) □ (IV) (Required to undertake all 4 courses. 8 credits needed for graduation.)					4	4	4	4

Note:

1. As an incoming student, she/he has the choice of joining either group A or group B and fulfills respective course requirements for graduation. Each student is allowed to request a one-time group switch before the beginning of an academic year.
2. Should one chooses to switch group, courses that are traded for substitutions can only be counted once towards graduation credits.
3. List of courses that can be substituted for courses in a different group:
   (1) Groups A's courses counted as group B's courses:
   General Physics (I) and Theoretical Mechanics substitute for Fundamentals of Physics (I), General Physics (II) and Electromagnetics substitute for Fundamentals of Physics (II), Modern Physics and Quantum Physics (I) substitute for Fundamentals of Physics (III), Thermal and Statistical Physics substitutes for Fundamentals of Physics (IV).
   (2) Groups B's courses counted as group A's courses:
   Fundamentals of Physics (I) substitutes for either General Physics (I) or Theoretical Mechanics, Fundamentals of Physics (II) substitutes for either General Physics (II) or Electromagnetics, Fundamentals of Physics (III) substitutes for either Modern Physics or Quantum Physics (I), Fundamentals of Physics (IV) substitutes for Thermal and Statistical Physics.
   (3) After transferring course(s) from group A to group B, excess credit(s) after substitution will not be counted as graduation credit(s).
   (4) After transferring from group B to group A, the student is responsible for making up the required credits guided by group A's course requirement.
4. Rules for the course of Literature Study and Term Paper Writing:
   (1) Group A students will earn no graduation credit for taking this course.
   (2) For group B students: An oral presentation, arranged by the Department and open to public, on the research progress is required once each academic year. The performance of the oral presentation will be taken as semester's course grade. The research work has to be formally written before graduation and be judged by committee members.
5. For those who fails the course of General Physics (I, 4 credits), are allowed to take both General Physics (I, 3 credits) and General Physics Laboratory (I, 1credit) to fulfill the course requirement. For those who fails the course of General Physics (II, 4 credits), are allowed to take both General Physics (II, 3 credits) and General Physics Laboratory (II, 1 credit) to fulfill the course requirement.
6. For a student transferring from another department/university: The Department suggests to choose group A and fulfill the course requirements. If the student has passed the course(s) of General Physics (I/II) with less than 4 credits per course prior to the transition, the student can either follow Rule #5 or take elective course(s) to make up the inadequate credit(s).

(3) Elective courses offered by Department: Group A: 23 credits, group B: 24 credits.

1. Group A: a minimum of 12 credits offered through senior (4^{th}) year.
2. Group B: a minimum of 12 credits offered through senior (4^{th}) year. The courses Applied Mathematics (I) and (II) can be counted to fulfill this requirement.
3. A maximum of 6 credits of the elective courses offered by the College of Sciences can be counted as Department's elective credits.
4. Seminar (I) and Seminar (II) from Master Program of the Department of Physics will not be counted as graduation credit(s).

(4) Free elective courses: group A: 16 credits, group B: 16 credits.

(1) The elective courses of military training and nursing are not counted as free elective courses, nor be counted towards graduation credits.

(2) The Department only accepts 28 general education course credits as free elective credits and graduation credits. Extra credits earned from the general education courses will be counted neither as free elective credits nor as graduation credits.

(3) A maximum of 3 credits, offered by Physical Education Center/Department of Athletic Sports as credited courses, can be counted as free elective credits and graduation credits.

(4) Credits exceeding the course requirement of the Teacher Education Program can be counted as free elective credits.

(5) Courses taking from the Language Center can be counted as free elective credits.

(6) For physics-major student: After completing a minimum of 20 credits in any one of the following three programs, the student will be presented a corresponding program's certificate issued by the Department.

A. Theoretical physics program

Programming language	3 credits	Quantum Physics (Ⅱ)	4 credits	Special Topic in Physics(Ⅰ~Ⅳ)	Each 2 credits
Electromagnetic Waves	3 credits	Mathematical Physics(junior)	3 credits	Introduction to Elementary Particle Physics	3 credits
Introduction to Solid State Physics(Ⅰ)	3 credits	Introduction to Computational Physics	4 credits	Quantum Mechanics(Ⅰ)(Ⅱ)	Each 3 credits
Electrodynamics(Ⅰ)	3 credits	Statistical Mechanics(Ⅰ)	3 credits	Classical Mechanics	3 credits
Theory of relativity	3 credits	Advanced Mathematical Physics	3 credits	Condensed matter physics	3 credits
Biophysics		General biology (Ⅰ)(Ⅱ)	Each 3 credits	Biology	3 credits

B. Optoelectronic physics program

Programming language	3 credits	Quantum Physics (Ⅱ)	4 credits	Special Topic in Physics(Ⅰ~Ⅳ)	Each 2 credits
Electromagnet in Waves	3 credits	Experiments on Fundamental Physics(Ⅳ)	4 credits	Optics	3 credits
Introduction to Solid State Physics(Ⅰ)	3 credits	Introduction to Atomic and Molecular Physics	3 credits	Advanced Optics	3 credits
Solid State	Each 3	Special	3 credits	Nonlinear	3 credits

Physics(Ⅰ)(Ⅱ)	credits	Topics：Nanophotonics		Optics	
Linear Systems, Fourier Transforms and Optics	3 credits	Atomic Physics and Laser Spectroscopy	3 credits	Laser physic	3 credits
Introduction to Plasma Physics	3 credits	General biology (Ⅰ)(Ⅱ)	Each 3 credits	Biology	3 credits

C. Surface and magnetism program

Programming language	3 credits	Quantum Physics(Ⅱ)	4 credits	Special Topic in Physics(Ⅰ~Ⅳ)	Each 2 credits
Electromagnetic Waves	3 credits	Experiments on Fundamental Physics(Ⅳ)	4 credits	Introduction to Solid State Physics(Ⅰ)	3 credits
Introduction to Atomic and Molecular Phyics	3 credits	Solid State Physics(Ⅰ)(Ⅱ)	Each 3 credits	Surface Physics	3 credits
Materials Science	3 credits	Special Topics：Magnetism	2 credits	Special Topics：Introduction to Spintronics	3 credits
Special Topics：Nanophotonics	3 credits	The applications of X-ray spectroscopies in condensed matter physics	3 credits		