

FACULTY OF SCIENCE

Physics

Study Scheme

Master of Science Programme in Physics (Full-time and Part-time)

Applicable to students admitted in 2025-26 and thereafter

1. Coursework Requirement

Students are required to complete a minimum of 24 units of Physics courses at 5000-level and above for graduation.

2. Other Requirements

- (a) Students must fulfill the Term Assessment Requirement of the Graduate School. For details, please refer to Clause 13.0 "Unsatisfactory Performance and Discontinuation of Studies" of the General Regulations Governing Postgraduate Studies which can be accessed from the Graduate School Homepage: <https://www.gs.cuhk.edu.hk>.
- (b) A student must achieve a cumulative grade point average (GPA) of at least 2.0 in order to fulfill the graduation requirement, unless special approval is granted by the Graduate Council.

3. Remarks

- (a) With the permission of the Graduate Panel, up to 3 units from courses at 4000-level and above in PHYS and/or 6 units of MSEG courses at 5000-level and above may be substituted.
- (b) No more than 12 units from PHYS5710, 5720, 5730, 5990, and 5991 will be counted towards the 24 units required for graduation.
- (c) A dissertation option is open to students upon successful arrangement with a supervisor. Students are required to spend 6 units in the form of a Guided Study or project III course (PHYS 5710, 5720, 5730 or 5990) plus PHYS 5991, to be taken either in different terms or in the same term. While the courses are to be assessed separately, they together provide the opportunity for a student to acquire the necessary background knowledge and skills of a research area, possibly carry out a project, and compose a dissertation that reflects the student's broad reading and understanding of the area. Students should make the necessary arrangement with a supervisor at the earliest time possible in their study.

Applicable to students admitted in 2022-23 to 2024-25

1. Coursework Requirement

Students are required to complete a minimum of 24 units of Physics courses at 5000-level and above for graduation.

2. *Other Requirements*

- (a) Students must fulfill the Term Assessment Requirement of the Graduate School. For details, please refer to Clause 13.0 “Unsatisfactory Performance and Discontinuation of Studies” of the General Regulations Governing Postgraduate Studies which can be accessed from the Graduate School Homepage: <https://www.gs.cuhk.edu.hk>.
- (b) A student must achieve a cumulative grade point average (GPA) of at least 2.0 in order to fulfill the graduation requirement, unless special approval is granted by the Graduate Council.

3. *Remarks*

- (a) With the permission of the Graduate Panel, up to 3 units from courses at 4000-level and above in PHYS and/or 6 units of MSEG courses at 5000-level and above may be substituted.
- (b) No more than 12 units from PHYS5710, 5720, 5730, 5990, and 5991 will be counted towards the 24 units required for graduation.
- (c) A dissertation option is open to students in the full-time mode upon successful arrangement with a supervisor. Students are required to spend 6 units in the form of a Guided Study course (PHYS 5710, 5720, or 5730) plus PHYS 5991, to be taken either in different terms or in the same term. While the courses are to be assessed separately, they together provide the opportunity for a student to acquire the necessary background knowledge and skills of a research area, possibly carry out a project, and compose a dissertation that reflects the student's broad reading and understanding of the area. Students should make the necessary arrangement with a supervisor at the earliest time possible in their study. Students in the part-time mode who want to opt for a dissertation should seek prior approval from the Graduate Panel after they make arrangement with a supervisor.

Course List

<u>Code</u>	<u>Course Title</u>	<u>Unit</u>
MSEG5020	Frontiers in Materials Science	3
MSEG5040	Topics in Advanced Materials Research IV (Electron Microscopy: Principles, Techniques and Analysis)	3
MSEG5080	Surface Science	3
PHYS5061	From Computational Physics to Artificial Intelligence	3
PHYS5110	Fundamentals of Classical Mechanics and Special Relativity	3
PHYS5120	Fundamentals of Modern Quantum Mechanics	3
PHYS5130	Principles of Thermal and Statistical Physics	3
PHYS5140	Classical Electromagnetic Theory	3
PHYS5160	Computational Physics	3
PHYS5320	Photonics: Materials and Devices	3
PHYS5330	Instrumentation I	3
PHYS5350	Techniques in Materials Characterization	4
PHYS5410	Advanced Quantum Mechanics	3
PHYS5420	Classical Electrodynamics	3
PHYS5430	Solid State Theory	3
PHYS5450	Introduction to Soft Matter Physics	3

PHYS5460	Instrumentation II	3
PHYS5510	Topics in Theoretical Physics (Advanced Statistical Mechanics)	3
PHYS5520	Topics in Theoretical Physics (Introduction to Many-body Theory)	3
PHYS5530	Topics in Theoretical Physics (Introduction to Particle Physics)	3
PHYS5540	Topics in Theoretical Physics (Advanced Computational Physics)	3
PHYS5550	Topics in Theoretical Physics (Quantum Optics)	3
PHYS5560	Topics in the Frontiers of Physics	3
PHYS5562	Topics in Theoretical Physics (Astrophysics)	3
PHYS5580	Physics of Quantum Information and Quantum Computation	3
PHYS5590	Modern Atomic Physics	3
PHYS5610	Introduction to Biophysics	3
PHYS5620	Topics in Experimental Physics (Thin Film Physics and Technology)	3
PHYS5660	Semiconductor Physics and Devices	3
PHYS5710	Guided Study	3
PHYS5720	Guided Study	3
PHYS5730	Guided Study	3
PHYS5790	Guided Study	3
PHYS5990	Project III	3
PHYS5991	MSc Dissertation	3

Programme Learning Outcomes for Master of Science in Physics

The following is a specification of the key learning outcomes (knowledge, skills, values and attitude) for Master of Science in Physics graduates at The Chinese University of Hong Kong.

1. Knowledge Outcomes

Graduates should possess advanced knowledge of physics of higher level, including concepts and principles in

- (1) classical mechanics, electrodynamics, quantum mechanics and thermodynamics;
- (2) mathematical (analytic and numerical) methods and experimental methods for physics.

2. Skills Outcomes

Graduates should have acquired the following professional skills to deal with representative physics problems and situations at the master degree level:

- (1) understanding literature in physics frontiers by independent reading;
- (2) identifying the key factors and applying appropriate principles, assumptions, and methods in the formulation of physics problems;
- (3) applying the physics knowledge and methods in a physics-related professional field (in education, research, analysis, etc).

3. Attitude/Value Outcomes

Graduates should have developed some positive attitudes and values, including the following:

- (1) appreciation of physics principles and theories, and the beauties of physics at an advanced level;
- (2) awareness of the impact of physics in social, economical, and environmental issues and willingness to promote physics in scientific development and general education of the society;
- (3) understanding the potential applications and knowledge implications of frontier developments in modern physics research.