FACULTY OF ENGINEERING

Systems Engineering and Engineering Management

Study Scheme

M.Phil. – Ph.D. Programme in Systems Engineering and Engineering Management (Full-time and Part-time)

Please read the Study Scheme in conjunction with the following emails:

1. "Completing certain Improving Postgraduate Learning modules in the first year of study (for fulfilment of Ph.D. and Taught Doctoral candidacy requirements) with retroactive effect from 2022-23 intake", dated 27 October 2023: https://www.gs.cuhk.edu.hk/download/IPL.pdf.

2. "Amendments to Research Data Management Practice and Requirements for Candidacy and Graduation -- applicable to RPg and taught doctoral students admitted in 2025/26 or thereafter", dated 20 February 2026: https://www.gs.cuhk.edu.hk/download/Amendments.pdf.

A. M.Phil. Student

1. Coursework Requirement

(a) Lecture courses:

Each M.Phil. student is required to complete at least 4 graduate courses with a total of 12 units, subject to the approval of his/her supervisor and the Division Head. Undergraduate courses (Coded 4xxx or below) cannot be used to fulfill this requirement.

Research areas:

Area I: Operations Research

ENGG5501, SEEM5160, 5350, 5380, 5390, 5410, 5580, 5650

Area II: Information System

SEEM5010, 5020, 5030, 5160, 5330, 5640, 5680

Area III: Engineering Management

ENGG5501, SEEM5390, 5580

Area IV: Financial Engineering

SEEM5160, 5340, 5390, 5410, 5570, 5670
Other courses: SEEM5120, 5121

(b) Thesis research / monitoring courses:
Each M.Phil. student must register for the relevant Thesis Research Course in every term throughout his/her study period.
- Full Time M.Phil. students: SEEM8006
- Part Time and Continuing M.Phil. students: SEEM8003

(c) Other course(s):
Each M.Phil. student must complete the seminar courses (SEEM5201 and SEEM5202) in his/her first year of study. In addition, each M.Phil. student is required to give a presentation on his/her research progress each year before his/her Thesis Advisory Committee and submit a written research report during his/her normative period of study.

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) Students are required to submit a research thesis, and pass an oral examination for graduation.
(c) Students are required to complete an Improving Postgraduate Learning (IPL) module on “Observing Intellectual Property and Copyright Law during Research”. This is an online module and relevant information can be accessed from the website: https://www.cuhk.edu.hk/clear/prodev/ipl.html.
(d) Students are required to complete and pass an IPL module on “Basics of Research Data Management” in their first year of study, with effect from the 2022-23 intake. This is an online module and relevant information can be accessed from the website: https://www.cuhk.edu.hk/clear/prodev/ipl.html (under "Research Skills").
(e) Students are required to submit a Data Management Plan (DMP) during the first year of study, with effect from the 2025-26 intake. The final DMP should have been shared to the CUHK community on DMPTool or the relevant platform that CUHK provides when submitting the final version of the thesis/portfolio to the Graduate School. The guide is available on Library’s website: https://libguides.lib.cuhk.edu.hk/rdm/mandate-support.
(f) Students are required to complete an online Research Ethics Training (RET) module on “Publication Ethics” offered by the Research Office (RO) and obtain a valid Publication Ethics Certificate for graduation. Relevant information can be accessed from the RET website at https://www.research-ethics.cuhk.edu.hk/web/.

3. Remark(s)

Exemption to any of the above requirements must be approved by the Division Head on a case-by-case basis.

B. Ph.D. Student (Pre-candidacy)

The "candidacy requirement" composes of four major parts, namely, coursework requirement, candidacy examination, thesis proposal (and oral defence) and stipulated Improving Postgraduate Learning (IPL) module requirements. Students must complete and fulfill the first three parts within the "maximum period for fulfilling candidacy requirements" and complete the stipulated IPL module(s) in their first year of study. Details of the requirement are listed below:

1. Coursework Requirement

(a) Lecture courses

(Applicable to students admitted in 2025-26 and thereafter)

Subject to the approval of a Ph.D. student's supervisor and the Division Head, the student is required to complete at least 6 courses with a total of 18 units to fulfill the overall PhD coursework requirement. Among the 6 courses, at least 4 courses with a total of 12 units are required to be completed during the pre-candidacy stage, including at least 1 faculty core course.

(Applicable to students admitted between 2022-23 and 2024-25)

Subject to the approval of a Ph.D. student's supervisor and the Division Head, the student is required to complete at least 6 courses with a total of 18 units to fulfill the overall PhD coursework requirement. Among the 6 courses, at least 4 courses with a total of 12 units are required to be completed during the pre-candidacy stage, including at least 1 faculty core course. To satisfy the faculty core course requirement, students must achieve at least a grade B in the course. Otherwise, the course will only be counted as an elective.

(Applicable to students admitted between 2019-20 and 2021-22)

Subject to the approval of a Ph.D. student's supervisor and the Division Head, the student is required to complete at least 7 courses with a total of 21 units to fulfill the overall PhD coursework requirement. At most 1 undergraduate course (Coded 4xxx or below) with a total of 3 units can be used to fulfill this requirement. Among the 7 courses, at least 4 courses with a total of 12 units are required to be completed during the pre-candidacy stage, including at least 1

faculty core course. To satisfy the faculty core course requirement, students must achieve at least a grade B in the course. Otherwise, the course will only be counted as an elective.

Research areas:

Area I: Operations Research

ENGG5501, SEEM5160, 5350, 5380, 5390, 5410, 5580, 5650

Area II: Information System

SEEM5010, 5020, 5030, 5160, 5330, 5640, 5680

Area III: Engineering Management

ENGG5501, SEEM5390, 5580

Area IV: Financial Engineering

SEEM5160, 5340, 5390, 5410, 5570, 5670

Other courses: SEEM5120, 5121

(b) Thesis research / monitoring courses

Each Ph.D. student must register for the relevant Thesis Research Course in every term throughout his/her study period.

- Full-time Ph.D. (pre-candidacy) students: SEEM8006
- Part-time Ph.D. (pre-candidacy) students: SEEM8003

(c) Other course(s) or programme requirements

Each Ph.D. student must complete the seminar courses (SEEM5201 and SEEM5202) in his/her first year of study.

2. Candidacy Examination

(a) Each Ph.D. student is required to pass a written candidacy examination within the maximum period of his/her pre-candidacy stage for the advancement to his/her post-candidacy stage. The purpose of this examination is to test the student's basic knowledge and understanding in the SEEM discipline. Specifically, in order to advance to his/her candidature, a student must demonstrate proficiency in one primary area and one secondary area as given in the PhD Candidacy Examination Reading List, which currently includes: Stochastic Modeling; Stochastic Calculus; Information Systems; and Operations Research.

(b) The procedure for the candidacy examination is described as follows:

(i) The examination will be administrated once per year.

(ii) A student is required to sit for the examination no later than 18 months after his/her enrolling in the Ph.D. programme.

(iii) This is a written examination consisting of questions from each focal area. Students should attempt the questions in two focal areas.

(iv) The Graduate Division maintains but periodically updates a reading list for each focal area.

(v) A committee appointed by the Graduate Division, based on the overall mark of a student, makes recommendations to the Graduate Division.

(vi) A student who has passed a candidacy examination will advance to his/her candidature.

(vii) A student who has failed a candidacy examination should take the next examination.

(viii) A student is required to discontinue from his/her Ph.D. study if he/she is unable to achieve a PASS grade in two candidacy examinations.

3. Thesis Proposal and Oral Defence

Each Ph.D. student is required to submit a written thesis proposal and pass the oral defence of the proposal within the maximum period of his/her pre-candidacy stage.

4. Other Requirements

Students are required to complete the following Improving Postgraduate Learning (IPL) modules in their first year of study for partial fulfillment of candidacy requirements:

(a) Students are required to complete and pass an IPL module on “Basics of Research Data Management” in their first year of study, with effect from the 2022-23 intake. This is an online module and relevant information can be accessed from the website: https://www.cuhk.edu.hk/clear/prodev/ipl.html (under "Research Skills").

(b) Students are required to submit a Data Management Plan (DMP), with effect from the 2025-26 intake. The guide is available on Library’s website: https://libguides.lib.cuhk.edu.hk/rdm/mandate-support.

C. Ph.D. Student (Post-candidacy)

1. Coursework Requirement

(a) Lecture courses

(Applicable to students admitted in 2022-23 and thereafter)

Each Ph.D. student is required to complete at least 2 courses with a total of 6 units during the post-candidacy stage among the overall PhD coursework requirement, subject to the approval of his/her supervisor and the Division Head. A student may choose to complete this course requirement during his/her pre-candidacy stage.

(Applicable to students admitted between 2019-20 and 2021-22)

Each Ph.D. student is required to complete at least 3 courses with a total of 9 units during the post-candidacy stage among the overall PhD coursework requirement, subject to the approval of his/her supervisor and the Division Head. A student may choose to complete this course requirement during his/her pre-candidacy stage.

Research areas:

Area I: Operations Research

ENGG5501, SEEM5160, 5350, 5380, 5390, 5410, 5580, 5650

Area II: Information System

SEEM5010, 5020, 5030, 5160, 5330, 5640, 5680

Area III: Engineering Management

ENGG5501, SEEM5390, 5580

Area IV: Financial Engineering

SEEM5160, 5340, 5390, 5410, 5570, 5670

Other courses: SEEM5120, 5121

(b) Thesis research / monitoring courses

Each Ph.D. student must register for a Thesis Research Course every term throughout his/her study period.

- Full-time Ph.D. (post-candidacy) students: SEEM8012
- Part-time Ph.D. (post-candidacy) students: SEEM8006
- Continuing Ph.D. students: SEEM8003

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) Each Ph.D. (post-candidacy) student is required to give a presentation on his/her research progress before his/her Thesis Advisory Committee and submit a research report during his/her normative period of study.

(c) Students are required to submit a research thesis, and pass an oral examination for graduation.

In addition to completing the IPL modules stipulated for partial fulfillment of candidacy requirements, students are also required to complete the following IPL modules for graduation:

(d) Complete an IPL module on “Observing Intellectual Property and Copyright Law during Research”. This is an online module and relevant information can be accessed from the

website: https://www.cuhk.edu.hk/clear/prodev/ipl.html.

(e) Complete an online Research Ethics Training (RET) module on "Publication Ethics" offered by the Research Office (RO) and obtain a valid Publication Ethics Certificate for graduation. Relevant information can be accessed from the RET website at https://www.research-ethics.cuhk.edu.hk/web/.

(f) The final DMP should have been shared to the CUHK community on DMPTool or the relevant platform that CUHK provides when submitting the final version of the thesis/portfolio to the Graduate School. The guide is available on Library's website: https://libguides.lib.cuhk.edu.hk/rdm/mandate-support.

3. Remark(s)

Exemption to any of the above requirements must be approved by the Division Head on a case-by-case basis.

Course List

Code	*Course Title*	*Unit*
SEEM5010	Advanced Database and Information Systems	3
SEEM5020	Algorithms for Big Data	3
SEEM5030	Generative Artificial Intelligence	3
SEEM5120	Advanced Topics in Systems Engineering and Engineering Management (I)	3
SEEM5121	Advanced Topics in Systems Engineering and Engineering Management (II)	3
SEEM5160	Advanced Data Science for Systems Engineering	3
SEEM5201	Seminars in Systems Engineering and Engineering Management (I)	1
SEEM5202	Seminars in Systems Engineering and Engineering Management (II)	1
SEEM5330	Speech and Language Processing	3
SEEM5340	Stochastic Calculus	3
SEEM5350	Numerical Optimization	3
SEEM5380	Optimization Methods for High-Dimensional Statistics	3
SEEM5390	Stochastic Optimization and Risk Management	3
SEEM5410	Optimal Control	3
SEEM5570	Numerical Methods in Finance	3
SEEM5580	Advanced Stochastic Models	3
SEEM5640	Conversational Artificial Intelligence Systems	3
SEEM5650	Integer Programming	3
SEEM5670	Advanced Models in Financial Engineering	3
SEEM5680	Text Mining Models and Application	3
SEEM8003	Thesis Research	3

SEEM8006	Thesis Research	6
SEEM8012	Thesis Research	12
ENGG5101	Advanced Computer Architecture	3
ENGG5103	Techniques for Data Mining	3
ENGG5104	Image Processing and Computer Vision	3
ENGG5105	Computer and Network Security	3
ENGG5106	Information Retrieval and Search Engines	3
ENGG5108	Big Data Analytics	3
ENGG5202	Pattern Recognition	3
ENGG5281	Advanced Microwave Engineering	3
ENGG5282	Nanoelectronics	3
ENGG5291	Fiber Optics: Principles and Technologies	3
ENGG5301	Information Theory	3
ENGG5303	Advanced Wireless Communications	3
ENGG5383	Applied Cryptography	3
ENGG5392	Lightwave System Technologies	3
ENGG5402	Advanced Robotics	3
ENGG5403	Linear System Theory and Design	3
ENGG5404	Micromachining and Microelectromechanical Systems	3
ENGG5501	Foundations of Optimization	3
ENGG5601	Principles of Biomechanics and Biomaterials	3
ENGG5781	Matrix Analysis and Computations	3