Doctor of Philosophy Program in Pharmaceutical Technology
(International Program / Revised Program 2018)

Department of Pharmaceutical Technology

Name of the Program

Thai	หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาเทคโนโลยีเภสัชกรรม (หลักสูตรนานาชาติ)
English	Doctor of Philosophy Program in Pharmaceutical Technology (International Program)

Title of the Degree

Thai	ปรัชญาดุษฎีบัณฑิต (เทคโนโลยีเภสัชกรรม) ปร.ด. (เทคโนโลยีเภสัชกรรม)
English	Doctor of Philosophy (Pharmaceutical Technology) Ph.D. (Pharmaceutical Technology)

Study Venue

Faculty of Pharmacy, Silpakorn University, Sanam Chandra Palace Campus, Nakhon Pathom

Collaboration with other institutes

This curriculum is in collaboration with the Graduate School of Pharmaceutical Sciencesof Chiba University (Japan) under the Double Doctoral Degree Program. The program provides graduate students the opportunities to study and do research at Chiba University. Student who participated in the double degree program can receive two Doctoral's degrees from Silpakorn University and Chiba University.

Degree Awarded

Student(s) enrolling the Double Doctoral Degree Program

1. Doctor of Philosophy (Pharmaceutical Technology) from Silpakorn University and

2. Doctor of Philosophy (Pharmaceutical Sciences) from the Graduate School of Pharmaceutical Sciences of Chiba University.

However, students who do not participate in the program will receive only a Doctor of Philosophy (Pharmaceutical Technology) from Silpakorn University.

Objectives

1. To produce Ph.D. graduates with ethics and morality, imbued with responsible leadership in advanced pharmaceutical technology who can demonstrate the capability to acquire new knowledge independently, as well as skills in advance research innovation for pharmaceutical technology. In addition, graduates are expected to be able to work among diverse cultures as well.

2. To create new knowledge, theory, or novelties in pharmaceutical technology that will support sustainable domestic and also international industries.

3. To encourage research collaboration in pharmaceutical sciences with existing allied university in foreign countries and other leading universities in foreign countries.

Qualifications of Prospective Students

1. Requirements of a study plan as the followings:

1.1 Graduates of a Bachelor degree in pharmacy, health sciences or sciences and technology or related fields with a "very good" level of GPA or

1.2 Graduates of a Master degree in pharmacy, or other related fields of study with a "very good" level of GPA

2. English examination result according to the committee of Higher Education council or to the announcement of Silpakorn University as of standard English proficiency test for the admission of doctorate study

3. Accordance with Silpakorn University's 2007 Regulations on Graduate Study and/or later revision and/or updated amendment.

Other qualifications may also apply as reviewed by Committee of Faculty of Pharmacy.

Curriculum Structure

Type 1.1

Core courses (non-credit)	4	credits
Thesis (equivalent to)	48	credits
Total credits for the program	48	credits

Type 1.2

Core courses (non-credit)	7	credits
Preparatory courses (non-credit)	6	credits
Thesis (equivalent to)	72	credits
Total credits for the program	72	credits

Type 2.1

Core courses	4	credits
Elective courses not less than	8	credits
Thesis (equivalent to)	36	credits
Minimum credits earned from the entire program	48	credits

Type 2.2

Core courses	13	credits
Elective courses not less than	11	credits
Thesis (equivalent to)	48	credits
Minimum credits earned from the entire program	72	credits

Courses

1. Type 1.1

There are 48 credits for thesis and 4 additional, non-credit courses that will be assessed as S/U as follows;

1.1 Core courses (non-credit) 4 credits

551 671	Seminar in Pharmaceutical Technology I	1(0-3-0)
551 672	Seminar in Pharmaceutical Technology II	1(0-3-0)
551 673	Seminar in Pharmaceutical Technology III	1(0-3-0)
551 674	Seminar in Pharmaceutical Technology IV	1(0-3-0)

1.2 Thesis (equivalent to) 48 credits

550 908	Thesis	(equivalent to) 48 credits

2. Type 1.2

There are 72 credits for thesis. Students are required to study core courses and/or 7 additional, non-credit courses that will be assessed as S/U as follows;

2.1 Core courses (non-credit) 7 credits

550 534	Research Methodology in Pharmaceutical Technology	3(3-0-6)
551 671	Seminar in Pharmaceutical Technology I	1(0-3-0)
551 672	Seminar in Pharmaceutical Technology II	1(0-3-0)
551 673	Seminar in Pharmaceutical Technology III	1(0-3-0)
551 674	Seminar in Pharmaceutical Technology IV	1(0-3-0)

2.2 Preparatory courses (non-credit) 6 credits

551 702	Equipments in Pharmaceutical Technology	3(2-3-4)
551 747	Theoretical Aspects of Pharmaceutical Technology	3(3-0-6)

2.3 Thesis (equivalent to) 72 credits

550 909	Thesis	(equivalent to) 72 credits

3. Type 2.1

Course work is not less than 12 credits and 36 credits of thesis as follows;

3.1 Core courses 4 credits

551 671	Seminar in Pharmaceutical Technology I	1(0-3-0)
551 672	Seminar in Pharmaceutical Technology II	1(0-3-0)
551 673	Seminar in Pharmaceutical Technology III	1(0-3-0)
551 674	Seminar in Pharmaceutical Technology IV	1(0-3-0)

3.2 Elective courses 8 credits minimum from the following subjects

550 553	Current Topics in Pharmaceutical Technology	2(2-0-4)
551 702	Equipments in Pharmaceutical Technology	3(2-3-4)
551 705	Polymers in Pharmaceutical Sciences	3(3-0-6)
551 714	Advanced Pharmaceutical Technology I	3(2-3-4)
551 715	Advanced Pharmaceutical Technology II	3(2-3-4)
551 716	Biomaterials in Drug Delivery System	3(3-0-6)
551 719	Progress in Cosmetic Sciences and Technology	3(2-3-4)
551 729	Design and Development of Pharmaceutical Manufacturing Process	3(2-3-4)
551 747	Theoretical Aspects of Pharmaceutical Technology	3(3-0-6)
551 748	Materials for Pharmaceutical Packaging	3(3-0-6)

3.3 Thesis (equivalent to) 36 credits

550 907	Thesis	(equivalent to) 36 credits

4. Type 2.2

Course work is not less than 24 credits and 48 credits of thesis as follows;

4.1 Core courses 13 credits

550 534	Research Methodology in Pharmaceutical Technology	3(3-0-6)
551 671	Seminar in Pharmaceutical Technology I	1(0-3-0)
551 672	Seminar in Pharmaceutical Technology II	1(0-3-0)
551 673	Seminar in Pharmaceutical Technology III	1(0-3-0)
551 674	Seminar in Pharmaceutical Technology IV	1(0-3-0)
551 702	Equipments in Pharmaceutical Technology	3(2-3-4)
551 747	Theoretical Aspects of Pharmaceutical Technology	3(3-0-6)

4.2 Elective courses 11 credits minimum from the following subjects

550 553	Current Topics in Pharmaceutical Technology	2(2-0-4)
551 705	Polymers in Pharmaceutical Sciences	3(3-0-6)
551 714	Advanced Pharmaceutical Technology I	3(2-3-4)
551 715	Advanced Pharmaceutical Technology II	3(2-3-4)
551 716	Biomaterials in Drug Delivery System	3(3-0-6)
551 719	Progress in Cosmetic Sciences and Technology	3(2-3-4)
551 729	Design and Development of Pharmaceutical Manufacturing Process	3(2-3-4)
551 748	Materials for Pharmaceutical Packaging	3(3-0-6)

4.3 Thesis (equivalent to) 48 credits

550 908	Thesis	(equivalent to) 48 credits

Course Description

550 534 Research Methodology in Pharmaceutical Technology 3(3-0-6)

Systematic approach in conducting a research, including selection of research topic, planning and design of a research project, operational concepts of research, populations, samples, parameters and data, research proposal preparation, data collection, statistics for research, analysis and interpretation of research data, research work dissemination, research ethics in pharmaceutical technology.

550 553 Current Topics in Pharmaceutical Technology 2(2-0-4)

Novel concepts based on current information and trend in technology in research and development of new drugs, emphasizing pharmaceutical technology and process in order to obtain drugs with required specifications.

550 907 Thesis equivalent to 36 credits

Conducting a research study on pharmaceutical technology under the supervision of thesis advisors.

550 908 Thesis equivalent to 48 credits

Conducting a research study on pharmaceutical technology under the supervision of thesis advisors.

550 909 Thesis equivalent to 72 credits

Conducting a research study on pharmaceutical technology under the supervision of thesis advisors.

551 671 Seminar in Pharmaceutical Technology I 1(0-3-0)

Searching, retrieving and compiling scientific data in pharmaceutical technology from various sources, analysis of information collected for rational discussion and presentation.

551 672 Seminar in Pharmaceutical Technology II 1(0-3-0)

Searching, retrieving and compiling scientific data in pharmaceutical technology from various sources, analysis of information collected for rational discussion and presentation. The topic must be different from that in 551 671 Seminar in Pharmaceutical Technology I.

551 673 Seminar in Pharmaceutical Technology III 1(0-3-0)

Searching, retrieving and compiling scientific data in pharmaceutical technology from various sources, analysis of information collected for rational discussion and presentation. The topic must be different from that in 551 671 Seminar in Pharmaceutical Technology I and 551 672 Seminar in Pharmaceutical Technology II.

551 674 Seminar in Pharmaceutical Technology IV 1(0-3-0)

Searching, retrieving and compiling scientific data in pharmaceutical technology from various sources, analysis of information collected for rational discussion and presentation. The topic must be different from that in 551 671 Seminar in Pharmaceutical Technology I, 551 672 Seminar in Pharmaceutical Technology II and 551 673 Seminar in Pharmaceutical Technology III.

551 702 Equipments in Pharmaceutical Technology 3(2-3-4)

Theories, principles, techniques and practices of commonly encountered unit operations in pharmaceutical technology and related areas.

551 705 Polymers in Pharmaceutical Sciences 3(3-0-6)

Physicochemical properties of pharmaceutical polymers and their applications in dosage form design.

551 714 Advanced Pharmaceutical Technology I 3(2-3-4)

Theories, principles, and advanced skills of pharmaceutical products and delivery systems, factors influencing preparation of pharmaceutical dosage forms, fabrication and manufacturing stable products and related mechanisms.

551 715 Advanced Pharmaceutical Technology II 3(2-3-4)

Theories, principles, and advanced skills of novel pharmaceutical products and delivery systems, factors influencing preparation and evaluation of pharmaceutical dosage forms, fabrication and manufacturing stable products and related mechanisms.

551 716 Biomaterials in Drug Delivery System 3(3-0-6)

Theories and principles in the applications of biomaterials in pharmaceutical sciences, including research and development of drug delivery systems, desired properties of biomaterial and related mechanisms, and trends in the application of newly developed biomaterials in medical and pharmaceutical sciences.

551 719 Progress in Cosmetic Sciences and Technology 3(2-3-4)

Theories, principles, and advanced skills in novel cosmetic sciences and technology for design, formulation, evaluation, and manufacturing of cosmetic products, emphasizing medicated cosmetics, skin properties that enhance or limit the efficacy of medicated cosmetics, future trends in cosmetic development.

551 729 Design and Development of Pharmaceutical Manufacturing Process 3(2-3-4)

Pharmaceutical process development and design involved in scaling up the formulation from research and laboratory development to commercial production scale, including technology related to selection of suitable processes and equipments, process validation and master plan validation.

551 747 Theoretical Aspects of Pharmaceutical Technology 3(3-0-6)

Theories and principles in pharmaceutical technology, dosage form design and evaluations for research and development of pharmaceutical products.

551 748 Materials for Pharmaceutical Packaging 3(3-0-6)

Materials used for manufacturing of pharmaceutical packaging, processing and quality control of pharmaceutical packaging materials.

Graduation criteria

1. Accordance with the announcement of Ministry of Education as of standard regulation of graduate study 2558 BE. and/or updated amendment.
2. Accordance with Silpakorn University's 2007 Regulations on Graduate Study and/or updated amendment.
3. A graduate of Doctor of Philosophy Program in Pharmaceutical Technology must have all the following qualifications:

3.1 Students' dissertation or part(s) of the dissertation must be published or accepted for review in peer-review international journals recognized in pharmaceutical technology and related disciplines to ensure an acceptable standard of research work.

3.2 The dissertation must be written in English with the following conditions;

3.2.1 Plan 1: two papers have to be published or at least have to be accepted for publication from the thesis work or some parts of the thesis in the standard national or international journals according to the announcement of Higher Education council's guideline for circulation of academic journals.

3.2.2 Plan 2: one paper has to be published or at least have to be accepted for publication from the thesis work or some parts of the thesis in the standard national or international journals according to the announcement of Higher Education council's guideline for circulation of academic journals.

3.2.3 For students who receive the Royal Golden Jubilee Ph.D. Scholarship, graduation requirements of the scholarship must be complied with the regulation of the scholarship.