GRADUATE PROGRAMS

FACULTY OF PHARMACEUTICAL SCIENCES
KHON KAEN UNIVERSITY

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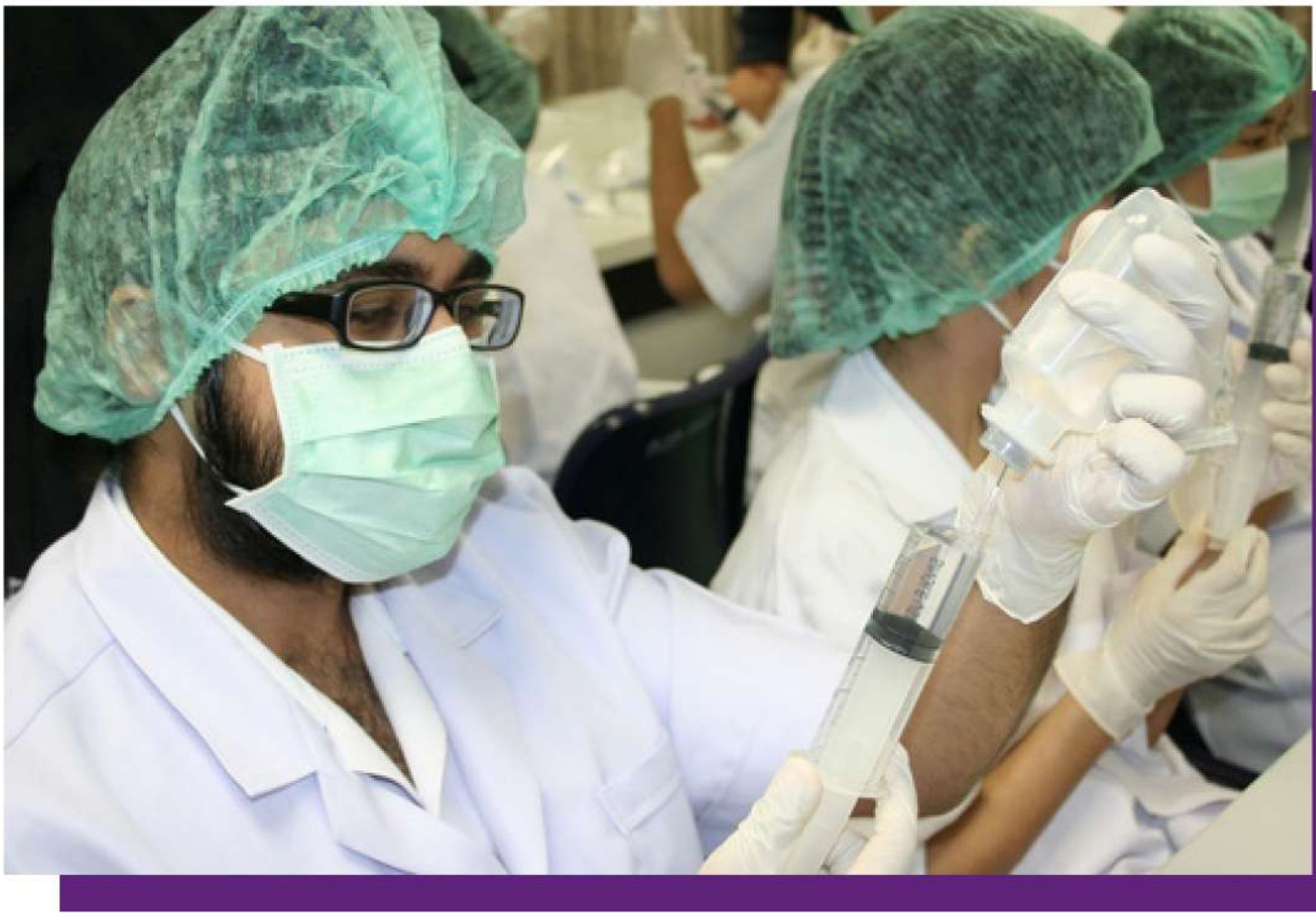
Assistant Professor Dr. Narin Chansri
Dean of Faculty of Pharmaceutical Sciences

Master of Sciences Program in Pharmaceutical Chemistry and Natural Products



Master of Sciences Program in Pharmaceutical Chemistry and Natural Products

Faculty of Pharmaceutical Sciences

General information

- **Program**

  Master of Sciences Program in Pharmaceutical Chemistry and Natural Products

- **Degree**

  M.Sc. (Pharmaceutical Chemistry and Natural Products)

- **Total credits**

  ≥ 36 credits (2 year program)

- **Study plan**

  1) Type A1 Thesis only

  2) Type A2 Course work and thesis

- **Language (Mode of teaching)**

  Thai and English

- **Future career after graduation**

  (1) University Instructor

  (2) Researcher

  (3) Industrial pharmacist

• Program structure

	Program structure	
	Type A1	Type A2
1) Compulsory	1*	15
2) Electives	-	9
3) Thesis	36	12
Total credits	**36**	**36**

* PS357 892 Seminar in Pharmaceutical Chemistry and Natural Products II 1(1-0-2) (audit)

Compulsory for Type A2

Code	Course	Credit
PS357 811	Research Methodology and Academic Writing	3(2-3-6)
PS357 891	Seminar in Pharmaceutical Chemistry and Natural Products I	1(1-0-2)
PS357 892	Seminar in Pharmaceutical Chemistry and Natural Products I	1(1-0-2)
PS357 894	Special Problems in Pharmaceutical Chemistry and Natural Products	3(1-6-9)

Electives for Type A2

Subject Groups

I. Analysis and Quality Control of Health Products

Code	Course	Credit
PS357 830	Quality Control of Health Products	3(2-3-6)
PS357 831	Dosage Forms of Herbal Products and Instruments for Production Process	3(2-3-6)
PS357 832	Application of Statistics in Pharmaceutical Research	3(2-3-6)
PS357 833	Instrumental Analysis	3(2-3-6)

II. Systhesis Chemistry

Code	Course	Credit
PS357 833	Instrumental Analysis	3(2-3-6)
PS357 834	Spectroscopic Method for Structure Elucidation	2(2-0-4)

PS357 835	Advanced Medicinal Chemistry	3(3-0-6)
PS357 836	Synthesis of Organic Medicinal Agents	3(3-0-6)

III. Chemistry of Herbs

Code	Course	Credit
PS357 833	Instrumental Analysis	3(2-3-6)
PS357 834	Spectroscopic Method for Structure Elucidation	2(2-0-4)
PS357 837	Phytochemistry	3(2-3-6)
PS357 838	Medicinal Plant Taxonomy	3(2-3-6)

IV. Biotechnology

Code	Course	Credit
PS357 833	Instrumental Analysis	3(2-3-6)
PS357 839	Pharmaceutical Biotechnology	2(2-0-4)
PS357 840	Biological Production Technology	2(2-0-4)
PS357 841	Biological Evaluation	2(1-3-4)
PS357 842	Medicinal Plant Tissue Culture	2(1-3-4)

V. Pharmaceutical Botany

Code	Course	Credit
PS357 838	Medicinal Plant Taxonomy	3(2-3-6)
PS357 842	Medicinal Plant Tissue Culture	2(1-3-4)
PS357 843	Ethnobotany	3(2-3-6)
PS357 844	Advanced Pharmaceutical Botany	2(1-3-4)
PS357 845	Thai Traditional Pharmacy	2(2-0-4)

Thesis

Code	Course	Credit
PS357 899	Thesis	16 Credits

Example of Study Plan

Year 1, Semester 1		Credits	
		Type A1	Type A2
PS357 811	Research Methodology and Academic Writing	-	3(2-3-6)
PS357 891	Seminar in Pharmaceutical Chemistry and Natural Products I (audit)	1(1-0-2)	1(1-0-2)
PS357 894	Special Problems in Pharmaceutical Chemistry and Natural Products	-	3(1-6-9)
	Elective Courses	-	2
PS357 898	Thesis	9	-
	Total credits	**10**	**9**
	Accumulate credits	**9**	**9**

Year 1, Semester 2		Credits	
		Type A1	Type A2
PS357 892	Seminar in Pharmaceutical Chemistry and Natural Products II (audit)	1(1-0-2)	1(1-0-2)
PSxxx xxx	Elective courses	-	6
PS357 898	Thesis	9	-
PS357 899	Thesis	-	2
	Total credits	**10**	**9**
	Accumulate credits	**18**	**18**

Year 2, Semester 1		Credits	
		Type A1	Type A2
PSxxx xxx	Elective courses	-	4
PS357 898	Thesis	9	-
PS357 899	Thesis	-	5
	Total credits	**9**	**9**
	Accumulate credits	**27**	**27**

Year 2, Semester 2		Credits	
		Type A1	Type A2
PS357 898	Thesis	9	-
PS357 899	Thesis	-	9
	Total credits	**9**	**9**
	Accumulate credits	**36**	**36**

Course description

PS357 811	Research Methodology and Academic Writing	3(2-3-2)
	Prerequisite : No	

Various research methods, literature reviews, references, research ethics, writing research proposal, writing academic and research articles for presentation and publication in academic journal

PS357 830	Quality Control of Health Products	3(2-3-6)
	Prerequisite : No	

Quality control of drugs, dietary supplements, cosmetics and herbal products; the national and international standards and regulations; quality control of raw materials; stability and contamination of the products

PS357 831	Dosage Forms of Herbal Products and Instruments for Production Process	3(2-3-6)
	Prerequisite : No	

Production of herbal products on liquid, semi-solid and solid form for oral and external uses, the preparation of herbal plants, selection of appropriate dosage form, packaging, labeling, evaluation of physical, chemical and microbiological properties; principle of instruments in production process of herbal product

PS357 832	Application of Statistics in Pharmaceutical Research	3(2-3-6)
	Prerequisite : No	

Selection and application of statistical basis for pharmaceutical research, design for drug formulations, clinical trial, analysis, quality of pharmaceutical products and biological evaluation

PS357 833	Instrumental Analysis	3(2-3-6)
	Prerequisite : No	

Techniques for high technology instruments quantitative and qualitative analysis; UV-visible spectrometry, spectrofluorometry, atomic absorption and emission spectrometry, electochemical, chromatographic method and flow injection analysis

PS357 834	Spectroscopic Method for Structure Elucidation	2(2-0-4)

Prerequisite : No

Structure elucidation of organic compounds by spectroscopy, ultraviolet-visible spectrometry, infrared spectroscopy, mass spectrometry, nuclear magnetic resonance spectrometry, interpretation of spectra

PS357 835	Advanced Medicinal Chemistry	3(3-0-6)

Prerequisite : No

Application of chemical, physical and biological principles to rational drug design and development process, traditional and modern application as well as innovative drug design strategies, methodologies and impacts from technology leading to drug design and development, bioinformatics, discussion on targetdiseases for research, case studies

PS357 836	Synthesis of Organic Medicinal Agents	3(3-0-6)

Prerequisite : No

Reactions of synthesis of organic medicinal compounds, classified by their functional groups, mechanism of the reactions of carbon and heterocyclic compounds

PS357 837	Phytochemistry	3(2-3-6)

Prerequisite : No

Chemistry of crude drugs and the secondary metabolites, extraction and isolation to obtain pure compounds, structure elucidation by spectroscopic methods, qualitative and quantitative analyses of active ingredients in crude drugs

PS357 838	Medicinal Plant Taxonomy	3(2-3-6)

Prerequisite : No

Diversity, classification and taxonomy of medicinal plants; nomenclature, constructions and uses of taxonomic keys, vegetation, evolution, variation and speciation of certain taxa of medicinal plants, genomic classification of medicinal plants, field trips

PS357 839	Pharmaceutical Biotechnology	2(2-0-4)

Prerequisite : No

Pharmaceutical biotechnology, fermentation technology, DNA recombinant technology, protein technology, application of biotechnology for pharmaceutical product development, current topics in pharmaceutical biotechnology, ethics and limitations in biotechnology research

PS357 840	Biological Production Technology	2(2-0-4)

Prerequisite : No

The use of technology in the production of biological products for human and animal use, application of effective delivery systems on biological product design and development as well as the stability, application of biotechnology in the production of biological active moieties, the quality control and assessment of biological products, regulations relevant to the biological products

PS357 841	Biological Evaluation	2(1-3-4)

Prerequisite : No

Importance of biological evaluation; conventional assessment of biological activity, modern concept and method in biological evaluation, selection criteria for biological evaluation methodologies; method development in biological evaluation, safety and precautions in biological laboratory, treatment of wastes, case studies

PS357 842	Medicinal Plant Tissue Culture	2(1-3-4)

Prerequisite : No

Basic principles and technique of plant tissue culture, composition, storage, selection and preparation of nutrient media, control of the appropriate conditions for tissue culture, application of genetic engineering for improvement of plant tissue culture

PS357 843	Ethnobotany	3(2-3-6)

Prerequisite : No

Direct interrelationship between human beings of various races and cultures and plants in their environment, principle, methods, and research methodology in ethnobotany, botanical excursion and collection of plant specimens; applications of ethnobotanical knowledge for agricultural development, for the search of new drugs, and conservation of plant diversity, bioprospecting

PS357 844	Advanced Pharmaceutical Botany	2(1-3-4)

Prerequisite : No

Historical background, morphology, and uses of medicinal plants in modern medicine, traditional medicine, dietary supplements, cosmetics, aromatic plants and spices, beverage and food plants, fiber plants, plants used as pharmaceutic aids, laboratory studies on medicinal plant morphology based on fresh specimens and herbarium specimens, and plant products, field trips

PS357 845	Thai Traditional Pharmacy	2(2-0-4)

Prerequisite : No

History, development and principle of Thai traditional pharmacy, traditional units for measurement, dosage forms, and compounding Thai traditional drugs, nature, taste and action of crude drugs, set of crude drugs and method of preparation, over-the-counter Thai traditional remedies, law and regulations; steps and procedures for obtaining professional license

PS357 891	Seminar in Pharmaceutical Chemistry and Natural Products I	1(1-0-2)

Prerequisite : No

Selected topic in pharmaceutical chemistry or natural product research, literature review and evaluate, presentation, discussion and report, work cooperate with others

PS357 892	Seminar in Pharmaceutical Chemistry and Natural Products II	1(1-0-2)

Prerequisite : No

Selected topic related to master thesis, literature review and evaluate, presentation, discussion and report, work cooperate with others

PS357 894	Special Problems in Pharmaceutical Chemistry and Natural Products	3(1-6-9)

Prerequisite : No

Selected topics in pharmaceutical chemistry or natural products, literature review, experimental design, experimentation, compiling and interpretation of results, presentation and report

PS357 898	Thesis	36 credits
	Prerequisite : Permission from program committee	
	Introduction to research in pharmaceutical chemistry and natural products, literature review, experimental design and planning, experimentation, compiling, interpretation, discussion, conclusion and suggestion of the results, reporting, presentation and publication ethics	

PS357 899	Thesis	16 credits
	Prerequisite : Permission from program committee	
	Introduction to research in pharmaceutical chemistry and natural products, rationale, importance, objectives and use of the outcome, literature in related to research, research methodology, comprehension, discussion, conclusion; presentation of the results; presentation and publication ethics	