



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 Toxicology







Master of Sciences Program in Toxicology

Faculty of Pharmaceutical Sciences
General information



- **Program**

Master of Sciences Program in Toxicology



- **Degree**

M.Sc. (Toxicology)



- **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) Scientist
- (3) Researcher

● Program structure

	Program structure	
	Type A1	Type A2
1) Compulsory	3	3
Compulsory	-	12
2) Electives	-	6
3) Thesis	36	18
Total credits	36	36

Compulsory for Type A1, A2 (audit)

Code	Course	Credit
PS377 891	Seminar in Toxicology I	1(1-0-3)
PS377 892	Seminar in Toxicology II	1(1-0-3)
PS377 893	Seminar in Toxicology III	1(1-0-3)

Compulsory for Type A2

Code	Course	Credit
PS377 711	Principles of Toxicology	3(3-0-6)
PS377 712	Systemic Toxicology	2(2-0-6)
PS377 713	Techniques and Methods in Toxicology	2(1-3-2)
PS377 714	Research Methodology and Biostatistic in Toxicology	3(2-3-6)
PS377 715	Advanced Toxicology	2(2-0-6)

Electives for Type A1, A2

Code	Course	Credit
PS377 831	Pesticide Toxicology	2(2-0-4)
PS377 832	Food Safety and Toxicity	2(2-0-4)
PS377 833	Mycotoxins	2(2-0-4)
PS377 834	Toxicogenomics and Pharmacogenomics	2(2-0-4)
PS377 835	Emergency Toxicology	2(2-0-4)

PS377 836	Addictive Substances and Substances of Abuse	2(2-0-4)
PS377 837	Industrial and Environmental Toxicology	3(3-0-6)
PS377 838	Risk Assessment of Toxicants	2(2-0-4)
PS377 839	Toxicity of Medicines and Herbal Products	2(2-0-4)

Thesis

Code	Course	Credit
PS377 898	Thesis	36 credits
PS377 899	Thesis	18 credits

Example of study plan

Year 1, Semester 1		Credits	
		Type A1	Type A2
PS377 711	Principles of Toxicology	-	3(3-0-6)
PS377 712	Systemic Toxicology	-	2(2-0-6)
PS377 713	Techniques and Methods in Toxicology	-	2(1-3-2)
PS377 891	Seminar in Toxicology I	1(1-0-3)	1(1-0-3)
PS377 898	Thesis	9	-
Total credits		9	10
Accumulate credits		9	9

Year 1, Semester 2		Credits	
		Type A1	Type A2
PS377 714	Research Methodology and Biostatistics in Toxicology	-	3(2-3-6)
PS377 715	Advanced Toxicology	-	2(2-0-6)
PS377 892	Seminar in Toxicology II	1(1-0-3)	1(1-0-3)
PS377 898	Thesis	9	-
PS377 899	Thesis	-	2
PS377 XXX	Elective Courses	-	4
Total credits		10	12
Accumulate credits		18	20

Year 2, Semester 1		Credits	
		Type A1	Type A2
PS377 892	Seminar in Toxicology III	1(1-0-3)	1(1-0-3)
PS377 898	Thesis	9	-
PS377 899	Thesis	-	9
Total credits		10	10
Accumulate credits		27	29

Year 2, Semester 2		Credits	
		Type A1	Type A2
PS377 898	Thesis	9	-
PS377 899	Thesis	-	7
Total credits		9	7
Accumulate credits		36	29



Course description

PS377 711	Principles of Toxicology	3(3-0-6)
Prerequisite: No		
Knowledge in scope of toxicology, behaviors of toxic substances in the body, mechanisms of substance action in the body, dose response relationship, toxicokinetics, toxicant disposition, descriptive toxicology, risk assessment, toxicities of substances, applications of toxicology		
PS377 712	Systemic Toxicology	2(2-0-6)
Prerequisite: No		
The toxic effects of chemicals and toxic substances on organ systems including blood, cardiovascular system, liver and gastrointestinal tract, renal, respiratory system, endocrine and reproductive system, nervous and immune systems, the effects on eyes, ears and skin, direct and indirect effects of toxicants on each organ and the relations of functions among organ systems		
PS377 713	Techniques and Methods in Toxicology	2(1-3-2)
Prerequisite: No		
Theory and practice of modern techniques used in the study of effects of chemicals and toxins from the molecular level to whole animals, analytical methods for study and determination of chemicals and toxicants, chromatography, spectroscopy, immunoassays, mutagenicity test, evaluation of chemical safety, analysis of data		
PS377 714	Research Methodology and Biostatistics in Toxicology	3(2-3-6)
Prerequisite: No		
Research methodology, research proposal writing such as literatures review via electronic resources, document collecting and citation using reference management software, guidelines for research proposal preparation such as literature reviews, study design, data collection, ethical considerations, statistical methods used by toxicologist as well as preparation of manuscript		

PS377 715	Advanced Toxicology	2(2-0-6)
Prerequisite: PS377 711, PS377 712		
Physiological and biochemical mechanisms of injury by toxic chemicals at cellular and subcellular levels, mechanisms of xenobiotics-induced toxic responses, molecular carcinogenesis, apoptosis and cell death mechanisms, stress responses, cellular adaptive responses to toxicants, genetic approaches to toxic susceptibility, intracellular signaling of injury, chemical and molecular biomarkers of exposure and injury		
PS377 831	Pesticide Toxicology	2(2-0-4)
Prerequisite: No		
Type and classification of pesticides commonly used in Thailand, health hazard and risk from using these pesticides, surveillance methods and analysis of pesticide residues in agricultural commodities including food/feed, vegetables and fruits, emergency management for pesticide poisoning		
PS377 832	Food Safety and Toxicity	2(2-0-4)
Prerequisite: No		
Toxic substances potentially found in food chain, global food safety situation and regulation, chemical hazards in food and their toxicity, quantitative and qualitative relationship between toxicants and nutritional or health status, novel scientific developments in the field of natural toxins, genetically modified foods, and food supplement products, principles and guidelines of safety evaluation and quality assurance of foods		
PS377 833	Mycotoxins	2(2-0-4)
Prerequisite: No		
Fungal growth and mycotoxins synthesis, contamination of mycotoxins in food and feed, mycotoxicoses in human and animals, Qualitative and quantitative analysis of mycotoxins in various samples, detoxification of mycotoxins, risk assessment of mycotoxins, regulation and policy needs in mycotoxins		
PS377 834	Toxicogenomics and Pharmacogenomics	2(2-0-4)
Prerequisite: No		
Response of a genome to environmental stress and toxicants, combined genetics, genomic-scale mRNA expression (transcriptomics), cell and tissue- wide protein expression (proteomics), and bioinformatics with conventional toxicology in an effort to understand the role of gene-environment interactions in diseases, impact of pharmacogenomics to drug discovery and development, particularly with those of significant clinical implications		

PS377 835	Emergency Toxicology	2(2-0-4)
Prerequisite: No		
Application of basic knowledge of toxicology to clinical practice to learn and understand the emergency management of poisoned patients from various toxicants, case studies of poisoned patients or simulated cases to develop skills and experience in problem solving and care of poisoned patients		
PS377 836	Addictive Substances and Substances of Abuse	2(2-0-4)
Prerequisite: No		
Epidemiology, pharmacology, toxicity and health hazard of major substance of abuses including opioids, hallucinogens, alcohol, nicotine, central nervous system depressants and stimulants, addictive behavior, primary diagnosis, treatment and rehabilitation for substance users, social and economic consequences of substance abuse in Thailand		
PS377 837	Industrial and Environmental Toxicology	3(3-0-6)
Prerequisite: No		
Toxic effects of exposure to industrial chemicals and environmental, adverse impacts caused by industrial chemicals and environmental pollutants originated from workplace, air, water, and soil, current issues, case study		
PS377 838	Risk Assessment of Toxicants	2(2-0-4)
Prerequisite: No		
Risk assessment of toxicants from various sources and environmental pollutants, discussion on the components of risk assessment and management processes, case studies in risk assessment		
PS377 839	Toxicity of Medicines and Herbal Products	2(2-0-4)
Prerequisite: No		
Basic and common problems in toxicity derived from using medicines and herbal products, biochemical principles and molecular mechanisms underlying the toxicities, the sequence of events leading to impairment of cell and organ functions, factors which determine and affect toxicity		

PS377 891	Seminar in Toxicology I	1(1-0-3)
Prerequisite: No		
Survey, review, discussion group working and presentation of recent interesting research aspect in toxicology		
PS377 892	Seminar in Toxicology II	1(1-0-3)
Prerequisite: PS377 891		
Survey, review, discussion group working and presentation of recent interesting research aspect possibly related to dissertation		
PS377 892	Seminar in Toxicology III	1(1-0-3)
Prerequisite: PS377 892		
Survey, review, discussion group working and presentation of research aspect related to dissertation		



PS377 898	Thesis	36 credits
Prerequisite: No		
Review of literature, conducting research in order to create scientific innovation and/or application in toxicology, ethics in research and writing the thesis, part of the research works should have high quality to be accepted for publishing in a national or international journal prior to thesis examination.		
PS377 898	Thesis	18 credits
Prerequisite: No		
Review of literature, conducting research in order to create scientific innovation and/or application in toxicology, ethics in research and writing the thesis, part of the research works should have high quality to be accepted for publishing in conference proceedings or in a national or international journal prior to thesis examination.		

