

MASTER OF SCIENCES TOXICOLOGY



Faculty of Pharmaceutical Sciences
Khon Kaen University

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

≥36credits (2 year program)

Study plan

- 1.1 Type A1 Thesis only
- 1.2 Type A2 Course work and thesis

Language (Mode of teaching)

Thai and English

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)
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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	10	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	36

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.