

## Planning and Quality Assurance Affairs

Form (A)

### Course Specifications

#### General Information

<b>Course name</b>	TOXICOLOGY
<b>Course number</b>	PHPT5219
<b>Faculty</b>	
<b>Department</b>	
<b>Course type</b>	Major Needs
<b>Course level</b>	5
<b>Credit hours (theoretical)</b>	2
<b>Credit hours (practical)</b>	0
<b>Course Prerequisites</b>	

#### Course Objectives

- 1 - 1. Understand the basic concepts and general principles of toxicology including definitions, areas of toxicology, scope of toxicology, types and characterization of toxic effects, mechanisms of toxicity, and general factors affecting toxicity.
- 2 - 2. Understand the sources and causes of poisoning, general principles involved in the management and treatment of poisoning through understanding the different methods and techniques and antidotes used in the management and treatment of poisoning.
- 3 - 3. Know in depth the different aspects of toxicity of selected therapeutic agents by studying the sources of exposure, mechanisms of toxicity, toxic doses, signs and symptoms of toxicity, and specific treatments involved.
- 4 - 4. Know in depth the different aspects of toxicity of selected drugs of abuse and hallucinogens by studying the sources of exposure, mechanisms of toxicity, toxic doses, signs and symptoms of toxicity, and specific treatments involved.
- 5 - 5. Know the concepts involved in food poisoning, animal toxins (snake, scorpion and spider venoms, etc.) emphasizing the source of exposure, signs and symptoms of toxicity, and specific treatments involved.
- 6 - 6. Understand the basic principles of toxicity of selected non-therapeutic agents including pesticides, metals, gases, and solvents, involving sources of exposure, mechanisms of toxicity, signs and symptoms and specific treatments involved.

## Intended Learning Outcomes

<b>Knowledge and Understanding</b>	<ul style="list-style-type: none"> <li>* 1. Know and understand the principles related to the scope and application of toxicology.</li> <li>* 2. Understand the different principles of toxicokinetics (absorption, distribution, metabolism and excretion) related to the toxicity of different toxic agents</li> <li>* 3. Know and understand the general principles involved in the management and treatment of a poisoned patient</li> <li>* 4. Describe the toxic responses of selected classes of therapeutic agents on various organs and system.</li> <li>* 5. Identify the major substances of abuse and their effects on humans.</li> <li>* 6. Know the toxic responses and specific treatment of selected food and animal toxins as well as non-therapeutic agents.</li> <li>* 7. Know the duties and application of different toxicology areas and disciplines</li> </ul>
<b>Intellectual Skills</b>	<ul style="list-style-type: none"> <li>* 1. Build up knowledge and scientific skills regarding the field of toxicology and its applications as well as its relation to other disciplines of science.</li> <li>* 2. Evaluate the effects of a given toxic agent on the human body.</li> <li>* 4. Able to identify and characterize different types of poisoning cases and apply the principles of different methods of management and treatment in different poisoning cases.</li> <li>* 3. Show a detailed of and understanding of how different types of exposure including exposures to therapeutic agents, drugs of abuse, as well as circumstances of environmental and occupational exposures to toxic agents can occur.</li> <li>* 5. Appraise the effectiveness of the preventive measures available to reduce the burden of toxic agents and protect human and other living organisms from toxic agents.</li> </ul>
<b>Professional Skills</b>	<ul style="list-style-type: none"> <li>* 1. Apply knowledge of toxicity of specified drugs and drug classes.</li> <li>* 2. Apply different methods and techniques in the management and treatment of poisoning cases of therapeutic and non-therapeutic agents.</li> <li>* 3. Demonstrate an ability to evaluate and utilize different information resources , including articles, internet websites, and references.</li> </ul>
<b>General Skill</b>	<ul style="list-style-type: none"> <li>* 1. Find, understand, analyze, evaluate, and synthesize information about the exposure circumstances, mechanisms of toxicity, signs and symptoms as well as treatment of different toxic agents.</li> <li>* 2. Make informed, rational, and responsible decisions about different issues in toxicology.</li> <li>* 4. Work and communicate effectively with general population, colleagues and people of other professions regarding any issue in the field of toxicology.</li> </ul>

## Course Contents

- 1 - General principles of toxicology, including definitions, areas and scope of toxicology, types and characterization of toxic effects, interactions between chemicals, mechanisms of toxicity, and general factors affecting toxicity.
- 2 - 2. General principles involved in the management and treatment of poisoning: causes and sources of poisoning, advantages, disadvantages and application of different methods and techniques including emesis, gastric lavage, activated charcoal, whole bowel irrigation, forced diuresis, alkalization and acidification of urine, hemodialysis, hemoperfusion, peritoneal dialysis, plasma-plasma exchange, as well as common antidotes used in the management and treatment of poisoning.
- 3 - 3. Different aspects of toxicity of selected therapeutic agents including sedative and hypnotics, non-steroidal anti-inflammatory agents, opioids, antihistamines, contraceptives, vitamins, etc. by studying the sources of exposure, mechanisms of toxicity, toxic doses, signs and symptoms of toxicity, and specific treatments involved.
- 4 - 4. Different aspects of toxicity of selected drugs of abuse and hallucinogens by studying the sources of exposure, mechanisms of toxicity, toxic doses, signs and symptoms of toxicity, and specific treatments involved.
- 5 - 5. Selected examples of food and animal poisoning including bacterial and fungal toxins in food, snake, scorpion and spider venoms, etc., emphasizing the source of exposure, signs and symptoms of toxicity, and specific treatments involved.
- 6 - 6. Different aspects of toxicity of selected non-therapeutic agents including pesticides, metals, gases, and solvents, involving sources of exposure, mechanisms of toxicity, signs and symptoms and specific treatments involved.

## Teaching and Learning Methods

- 1 - 1. Lectures, using Power point presentation software, when needed.
- 2 - 2. Class discussion and review of the important features of each topic through short informal writing assignments
- 3 - Class discussion regarding recent information in toxicology in the news and web pages.
- 4 - 4. A class presentation-case study of a poisoning incident reported in local hospitals or in the scientific literature (alone or in group)
- 5 - 5. Submitting and discussing a report about a topic of interest from an appropriate journal or text (alone or in group).

## Students Assessment

<u>Assessment Method</u>	<u>TIME</u>	<u>MARKS</u>
1-First mid-term exam	6th-7th week	40
secon-mid term	Not Applied	-----
3-Attendance and discussion	during the term	5
4-homework and project report	end of the term	5
-Final exam	end of the term	50

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## Books and References

Course note	Lecture notes in toxicology prepared by the lecturer
Essential books	Curtis D. Classen. (2014) Casarett and Doulos Toxicology. The basic science of poisons, 8th edition, McGraw-Hill Education
Recommended books	Frank A. Barile. (2004) Clinical toxicology. Principles and mechanisms, 2nd edition, CRC Press. Ernest Hadgson. (2004) A text book of modern toxicology, 3rd edition, Wiley interscience. Phillip L. Williams. (2000) Principles of Toxicology. Environmental and industrial application, 2nd edition, John Wiley and sons. Kent R. Olson. (1999). Poisoning and Drug Overdose, 4th edition, Lange Medical Books/McGraw-Hill.
Other References (Periodical, web sites, .... etc.)	Selected articles from official toxicology journals, when available. Official websites of WHO, FDA, IARC, ASTDR, etc.

## Knowledge and Skills Matrix

Main Course Contents	Study Week	Knowledge and Understanding	Intellectual Skills	Professional Skills	General Skill
1.General principles of toxicology					
2.General principles involved in the management and treatment of poisoning					
Different aspects of toxicity of selected therapeutic agents					
Different aspects of toxicity of selected drugs of abuse and hallucinogens					
Selected examples of food and animal poisoning					
Different aspects of toxicity of selected non-therapeutic agents					
	(1st-2nd weeks)				
	(3rd-5th weeks)				
	(6th-7th weeks)				
	(8th-10th weeks)				
	(11th-12th weeks)				
	(12th-14th weeks)				
		1. Know and understand the principles related to the scope and application of toxicology.			
		2. Understand the different principles of toxicokinetics			
		. Know and understand the general principles involved in the management and treatment of a poisoned patient.			

		4. Describe the toxic responses of selected classes of therapeutic agents on various organs and system.			
		5. Identify the major substances of abuse and their effects on humans			
		6. Know the toxic responses and specific treatment of selected food and animal toxins as well as non-therapeutic agents			
		7. Know the duties and application of different toxicology areas and disciplines.			
			1. Build up knowledge and scientific skills regarding the field of toxicology and its applications as well as its relation to other disciplines of science.		
			2. Evaluate the effects of a given toxic agent on the human body.		
			3. Show a detailed of and understanding of how different types of exposure can occur.		
			Able to identify and characterize different types of poisoning cases		

			Appraise the effectiveness of the preventive measures available to reduce the burden of toxic agents and protect human and other living organisms from toxic agents.		
				1. Apply knowledge of toxicity of specified drugs and drug classes.	
				2. Apply different methods and techniques in the management and treatment of poisoning cases of therapeutic and non-therapeutic agents.	
				3. Demonstrate an ability to evaluate and utilize different information resources , including articles, internet websites, and references.	
					1. Find, understand, analyze, evaluate, and synthesize information about the exposure circumstances, mechanisms of toxicity, signs and symptoms as well as treatment of different toxic agents.

					2. Make informed, rational, and responsible decisions about different issues in toxicology.
					3. Work and communicate effectively with general population, colleagues and people of other professions regarding any issue in the field of toxicology.