Relevant Programme: Bachelor of veterinary medical sciences
Institute offers the programme: Faculty of Veterinary Medicine
Department offers the course: Forensic Medicine and Toxicology
Scholar year: 2022 /2023

Course Specifications

A- Basic Information		
Title: Environmental Toxicology	**Code: PSEC 20**	**Level: Fourth & Fifth**
Theoretical: 1 hours	**Theoretical: 1 hour** **Practical: 2 hours**	**Total Credit hours: 2**

B- Professional Information:	
1-Aims:	**[1] Chapter one (General):** **- Definitions and concepts.** **- Sources of environmental pollutants.** **- Samples used or detection of environmental pollution.** **- Fate of environmental pollution.** **- Types of toxicity due to environmental pollution.** **- Toxic actions of pollutants.** **- Diagnosis and treatment of toxic cases and evaluation of environmental pollution.** **[2] Chapter Two (Air pollution):** **- Definitions.** **- Classification of air pollutants.** **- Causes and sources of air pollutants.** **- Effects of environmental pollutants including health effects on animals and humans.** **- Examples of some environmental effects:** *** Acid Rain (causes, formation and effects).** *** Visible smoke or smog and photochemical smog.** *** Greenhouse gases and greenhouse effects.** *** Bhopal Disaster** *** The Killer smog in London** **- Diagnosis and treatment of toxicity due to air pollutants.** **[3] Chapter Three (Water pollution):** **- Definitions**

	- Sources of water pollution (Point and non-point sources). **- Natural and anthropogenic sources.** **- Types of water pollutants (Physical, chemical & biological).** **- Physical pollution by thermal pollution & their effects on the ecosystem including fish.** **- Chemical pollution by petrochemicals and their effects on the ecosystem including humans, animals & biota.** **[4] Chapter Four (Soil pollution):** **- Definitions** **- Sources of soil pollution.** **- Natural and anthropogenic sources of soil pollution.** **- Types of soil pollution.** **- Chemical pollution by heavy metals, pesticides, fertilizers as well as wastes including E-Wastes and their effects on the ecosystem including humans, animals & biota.** **[5] Chapter Five (Radiation pollution):** **- Definitions and basic radiation concepts.** **- Types of radiation (Ionizing and non-ionizing).** **- Radiation units.** **- Different sources of radiation pollution.** **- Mode of action of radiation pollution.** **- Biological effects of ionizing radiation.** **[6] Chapter Six (Pollution by chemical warfare agents):** **- Definitions.** **- Different types of chemical warfare agents.** *** Nerve agents or poisons (G-agents, V-agents, A-230, A-232, A-234, A-242 and A-262).** *** Vesicant (Mustard gas, arsenical vesicants and nitrogen mustard).** *** Lung irritants (Choking gases)(Chlorine, phosgene and diphosgene).** *** Systemic poisons.** *** Lacimators.** **- Toxic effects of chemical warfare agents and how to deal with.** **- How to protect animals and humans from the effects of chemical warfare agents.** **[7] Chapter Seven (Biomarkers):** **- Definitions.** **- The general character of ideal biomarker.** **- Classification of biomarkers.** *** Biomarkers of exposure.** *** Biomarkers of effects (Gold standard tests, silver standard tests and bronze standard tests).**

	[8] Chapter Eight (Ecological Risk Assessment, ERA): **- Definitions and uses.** **- Basic concepts of ERA.** **- The strategies for recognizing environmental risks.** **- Framework for ERA.** **[9] Finally:** **- Examination of poisoned alive or dead animals and writing a correct medicolegal report in some cases if needed.** **- Prepare the students to acquire the basic concepts of environmental toxicology and pollution with a full information about the cellular toxicity and chemical actions on cells, organs and the whole body.** **- Application of general and specific antidotal therapy in veterinary field.**
2 – Intended Learning Outcomes (ILOs)	
Knowledge and Understanding:	**1- Know definitions and glossary used in the field of environmental Toxicology.** **2- Basic knowledge of diagnosis of acute and chronic toxicity.** **3- Understand toxic-kinetics concerning each item, such as absorption, distribution, excretion and biotransformation of environmental toxicants.**
Intellectual Skills	**1- Studying problems models and analyzing data.** **2- Training of solving multifactorial problems and differentiate between toxicological and non-toxicological causes of different environmental problems.** **3- Designing of experimental prevention and control protocols.**
Professional Skills	**1- Writing ideal medicolegal reports for the suspected to be intoxicated cases.** **2- Application of different methods for diagnosis and evaluation of intoxicated cases.** **3- Handling of animals for treatment of toxic cases.**
General Skills	**1- Use of computer in toxicological subjects.** **2- Communication and problem solving skills.** **3- Working in a team.**

3- Contents	**Theoretical practical** **. General. 1 2** **. Air pollution. ---- 1** **. Water pollution. 1 2** **. Soil pollution. 1 2** **. Radiation pollution. 1 2** **. Chemical warfare agents. 1 2** **. Biomarkers 1 2** **. Ecological Risk Assessment. 1 2** **. Examination evaluation, diagnosis and suitable treatment of suspected to be intoxicated cases. 1 2**
4- Teaching and Learning Methods	**1- Lectures.** **2- Practical and Laboratory Training.** **3- Information Collection and Analysis.** **4- Discussion sessions.** **5- Cases Study.**
5 – Teaching and Learning methods for Disables students	**1- Office Hours.** **2- Discussion sessions.** **3- Team work with others.**
6- Teaching and Learning Methods for Distinguished students	**1- Office Hours.** **2- Discussion sessions.** **3- Assignments and activities.**

7- Student Assessment	
Tools	**7.1- Examination:** **Mid-Term Exam. To measure a 1 & a2.** **Practical Exam. To measure C1, C2, & C3.** **Oral Exam. to measure a3, b1 & b2, and d1,d2,and d3** **Final term Exam. To measure a 1, a2, a3, b1, b2, & b3.** **7.2- Power point presentation to measure General skills and team working.**
Time Schedule	**Mid-term Exam…… ……. week…7th** **Practical Exam…… … .. week…12th** **Oral Exam.…… … week…13th** **Final Term Exam..…… …. week…13th**
Grading System	**Mid-Term Exam. 20%** **Practical Exam 20%**

	Oral Exam. 10% **Final Term Exam. 50%**
8- List of References	
Course Notes	**8.1- Course Notes:** **Department Veterinary Toxicology notes.**
Required Books (Text Books)	**8.2- Required Books (Text Books):** **Casarett and Doull's Toxicology** **Veterinary Toxicology (Cassarett &Doulls).7Th Ed.** **EDITOR, Curtis D. Klaassen, Ph.D.** **Toxicology and Therapeutics** **University of Kansas Medical Center** **Kansas City, Kansas** **McGraw-Hill, MEDICAL PUBLISHING DIVISION** **New York Chicago San Francisco Lisbon** **London Madrid Mexico City, New Delhi San** **Juan Seoul Singapore Sydney Toronto.**
Recommended Books	**8.3- Recommended Books:** **1- Clinical Vet. Toxicology (K. plumlee).** **2 Toxicology (Osweiler)**
Periodicals, Web Sites, … etc.	**8.4- Periodicals, Web Sites, … etc.:** **1- Pub med web site.** **2- Books for Toxicology.**

9- Facilities Required for Teaching and Learning:

Data Show projector.
Computers.
Models and Examples.
Museum.

Course Coordinator: Prof. Dr. Ahmed Abdel-Baky Sharkawy El-Sherif

Date: 1/10/2022

Program Director and College Dean: Prof.Dr. Madeha Hosni Darwish