LEAD CITY UNIVERSITY
FACULTY OF SCIENCES
DEPARTMENT OF BASIC SCIENCES (BIOLOGY)
SECOND SEMESTER 2017/2018 ACADEMIC SESSION

COURSE PARTICULARS

Course code: **EMT 318**
Course Title: **PRINCIPLES OF TOXICOLOGY 1**
No of Units: **3**
Status: **Compulsory**

LECTURER DETAIL

Name: **Dr. (Mrs.) Omonike C. Bakare**
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Area of Specialization: **Zoology (Fisheries and Environmental Biology)**

COURSE DESCRIPTION

EMT 318 entails history of toxicology, biochemistry, cellular and molecular toxicology. Biotoxins, carcinogenesis, teratogenesis and mutagenesis/genetic toxiology, biotransformation of toxicants. Systematic toxicology, toxic responses of blood, liver, kidney, respiratory systems, central nervous systems, skin, reproductive system, eye and the immune systems.

COURSE OBJECTIVES

The course builds upon introductory knowledge of toxicology and applies it to understanding the way in which chemicals react to produce toxic effect with major focus on target organ toxicity. Prerequisites: EMT 311.

ASSESSMENT

Test(s) and Assignments	**40%**
Final Examination	**60%**
Total	**100%**

LECTURE PLAN

Week	**Topic**
Week 1 - 2	Introduction to toxicology; History of toxicology
Week 3 – 5	Biochemistry, cellular and molecular toxicology
Week 6	Biotoxins
Week 7 – 9	carcinogenesis, teratogenesis and mutagenesis/genetic toxicology
Week 10	Systematic toxicology
Week 11 – 13	Toxic responses of blood, liver, kidney, respiratory systems, central nervous systems, skin, reproductive system, eye and the immune systems

Week 14	Descriptive Animal Toxicity Tests; Historical Control Incidence in Lab. Animals
Week 15	Revision

READING LIST

Hodgson, E. (2004). A Textbook of Modern Toxicology. Third edition. John Wiley & Sons, Inc., Hoboken, New Jersey. 557pp.

Hodgson, E., Mailman, R.B. and Chambers, J.E. (1998). eds. *Dictionary of Toxicology*, 2nd ed. London:Macmillan.

Klaassen, C.D. (2001). ed. *Casarett and Doull's Toxicology: The Basic Science of Poisons*, 6th ed. New York: McGraw-Hill.

Timbrell, J.A. (2000) *Principles of Biochemical Toxicology*, 3rd ed. London: Taylor and Francis.

Wexler, P. (2000). *Information Resources in Toxicology*, 3rd ed. San Diego: Academic Press.

TUTORIAL QUESTIONS

1 a. Define toxicology
b. Briefly describe the following: (i) Descriptive toxicology (ii) Mechanistic toxicology (iii) Regulatory toxicology

2 (a) Explain the epidemiology of poisoning (b) What is a dose?
(c) What is a dose-response?

3 Discuss: (a) absorption of toxic substances (b) pulmonary absorption
(c) percutaneous/dermal absorption (d) gastrointestinal absorption

4 Describe the following terms with relevant examples: (a) Allergic reactions
(b) Idiosyncratic reaction (c) Immediate vs. Delayed toxicity
(d) Reversible vs. irreversible toxic effects (e) Selective toxicity

5 Explain: (i) Accumulation of toxicants in lipid-rich tissues (ii) Retention of toxicants in the reticuloendothelial system (iii) Accumulation of toxicants in bones

6 Write an ESSAY on the Elimination of toxic substances

7 Explain: (a) excretion of toxic substances in urine and bile (b) Other routes of excretion of toxic substances

8 (a) What is biotransformation of toxic substances? (b) Discuss: (i) the role of the liver as the site of biotransformation (ii) The relationship between biotransformation and toxicity

9 Briefly discuss the following terms with examples: (a) acute exposure (b) sub-acute exposure (c) sub-chronic exposure (d) chronic exposure

10 (a) Using the illustration of the toxicological paradigm, describe toxicokinetics and Toxicodynamics (b) Briefly describe the three phases of penetration of a toxicant from the environment

11 Write an ESSAY on Biotoxins

12. Briefly discuss the following interaction of chemicals with examples: (a) additive effect (b) synergistic effect (c) potentiation effect (d) Antagonistic effect