

BHARATHIAR UNIVERSITY: COIMBATORE 641046**M.PHIL. / Ph.D. – (FT/PT) – Zoology**

(From October 2011 batch onwards)

Note:

There is no change in the existing papers. The newly framed syllabi for the **Paper III, Special Papers: TOXICOLOGY and VERTEBRATE ENDOCRINOLOGY** is furnished below.

TOXICOLOGY**Unit –I**

General Principles of Toxicology: Definition – Scope of Toxicology – Different areas of Toxicology- Classification of Toxic Agents –Route and Site of Exposure-Duration and Frequency of Exposure – Dose Response.

Unit –II

Disposition of Toxicants: Introduction- Absorption – Distribution – Excretion – Bio-transformation -Bioactivation.

Unit – III

Testing Procedures: Introduction – Bioassay – LC 50/LD 50 Determination-Acute Toxicity –Short-term and long term Studies – Experimental Design – Selection of Species.

Unit – IV

Target Organs: Gill - Liver – Kidney – Testing Procedures – Evaluation –Hematology – Biochemical – Histopathology Biomarkers.

Unit – V

Toxic Substances and Risk Assessment: Food additives and Contaminants – Toxicity of Pesticides – Metals – Types and Common Effects – Environmental Pollutants – Air, Water and Soil Pollutants – Endocrine Disruption - Assessment of Safety and Risk

Reference Books:

1. Frant C.L.V. 1991, Basic Toxicology II (Eds.), Hemisphere publishing corporation, Washington, London
2. Casarett and Doull's 1980. Toxicology: The Basic Science of Poisons.. II (Eds.) Macmillan publishing co., Inc, New York.
3. Butler, G.C. 198\78, Principles of Ecotoxicology. John Wiley and Sons, Chichester.
4. Fumi Matsumura, 1980. Toxicology of Insecticides. Plenum Press, New York and London.
5. Foster L. Mayer, Donald J. Versteeg, Michael, J. McKee and Barnett A. Ratlner, 1992, Biomarkers, physiological and non-specific biomarkers. Lewis publishers, London.
6. Sambasiva Rao K.R.S. 1999. Pesticide impact on fish metabolism. (Eds.) Discovery Publishing House, New Delhi.
7. Thomas J. Haley and William O. Berndt, 1987. Handbook of toxicology. Hemisphere Publishing Corporation, Washington.
8. Bio-pesticides in Insect Pest Management 1999. S. Ignacimuthu and Alok Sen, Phoenix Publishing House Pvt., Ltd., New Delhi.
9. Water Toxicology V.V. Metelev, Kanaev, N.G. Dzasokhova-Amerind Publishing Co., Pvt., Ltd., New Delhi.

VERTEBRATE ENDOCRINOLOGY

UNIT I.

OVERVIEW OF VERTEBRATE ENDOCRINE SYSTEM. Structural features and hormone synthesis, control, metabolism and functions of endocrine glands - hypothalamus, pituitary, pineal, thyroid, parathyroid (calcium and phosphate homeostasis), GI tract (gastrin, secretin and cholecystokinin), pancreatic islets and adrenals.

UNIT II.

CLASSES OF HORMONES AND MECHANISMS OF HORMONE ACTION: Peptide, thyroid, steroid, neuro-transmitters, neuropeptides, chalcones, peptide-growth stimulating factors, eicosanoids and pheromones.- Receptors and types- membrane receptors, nuclear receptors; receptor regulation and signal transduction, second messengers, permissive actions of hormones and termination of hormone action.

UNIT III.

ENDOCRINOLOGY OF SEX DIFFERENTIATION: Structure of gonads and hormones of male, female, seasonal breeding, pregnancy and parturition, contraception and pathophysiology of gonadal hormones.

UNIT IV

ENDOCRINE METHODOLOGIES: Ablation and replacement, bioassays, immunoassays, Immunocytochemistry, autoradiography, electrophysiological and pharmacological methods, hormone-receptor interactions, cloning techniques; Imaging and nuclear medicine in endocrine disease and hormone-replacement therapies.

UNIT V

ENDOCRINE APPLICATIONS IN TOXICOLOGY: Endocrine disruptors or modulators, sources (plant derived and xenobiotic), assessment of disruptor activity (*in vitro* assays, *in vivo* assays), Indirect mechanisms of action - effects on hormone metabolism, thyroid function, adrenal function, CNS function and behavior.

Reference Books:

- Molecular Endocrinology: Franklyn F. Bolander. Elsevier- Academic Press.
- Molecular Cell Biology: J. Darnell, H. Lodish and D. Baltimore Scientific American Book, Inc. USA
- Vertebrate Endocrinology: Norris, D. O. Academic Press, New York
- Endocrinology, Vol. I, II, III: D Groot. L. J. (ed.), W. B. Saunder Philadelphia
- Biochemical Actions of Hormones: Litwack, G. Academic Press. Principles of Anatomy and Physiology: Tortora, G. J. John Wiley & Sons, Inc.
- Essential Endocrinology: Brook, C.G.D. and Marshall, N.J. Blackwell Publishing. Endocrinology of pregnancy, parturition and lactation.
- Endocrine methodologies: Ablation and replacement, bioassays, immunoassays, Immunocytochemistry, autoradiography, electrophysiological and pharmacological methods, hormone-receptor interactions, cloning techniques.