DEPARTMENT OF ZOOLOGY

SYLLABUS FOR U.G(FYUP)

SEMESTER-I

MJ-I

ELEMENTARY PHYSIOLOGY

Unit-I: Tissues:

Structure, location, classification and function of epithelial tissue, connective tissue, muscular tissue and nervous tissue

Unit-II:. Muscle, Bone and Cartilage:

Histology of different type of muscles, Ultrastructure of skeletal muscle, Molecular and chemical basis of muscle contraction; characteristics of muscle twitch; Motor Unit, summation and tetanus. Structure and types of bones and Cartilage, Ossification, bone growth, resorption.

Unit-III:. Nervous system:

Structure of neurons, resting membrane potential, Origin of action potential and it's propagation across myelinated and unmyelinated nerve fibers. Types of synapsis, synaptic transmission and neuromuscular junction. Reflex action and it's types-reflex arc; Physiology of hearing and vision.

PRACTICAL:

1. Study of temporary mounts of Squamous epithelium, striated muscle fiber and nerve cells.
2. Demonstration of unconditioned reflex action (deep tendon reflex such as knee jerk reflexes.
3. Recording of simple muscle twitch with virtual stimulation.

References:

1.Guyton, A.C. and Hall, J.E. 2006. Textbook of Medical Physiology.11th Edition. Saunders, Philadelphia.

2. Martini F.H and Nath, J.L.2009. Fundamentals of Anatomy and Physiology. Pearson Benjamin Cummings.USA

3. Bipin Kumar.2001, Human Physiology. Campus Book International,bNew Delhi.

IRC

BIOMOLECULES

Unit-I :. Carbohydrates
Structure and biological importance of monosaccharides, disaccharides, polysaccharides and glycoconjugates.

Unit-II:. Lipids
Structure and significance; physiologically important saturated and unsaturated fatty acids, triglycerides, phospholipids, glycolipids and steroids.

Unit-III: Proteins
Amino acids: Structure, classification and general properties of alpha amino acids, physiological importance of essential and non-essential amino acids, urea cycle.
Bond stabilizing protein, structure and levels of organization in proteins. Introduction to simple and conjugated proteins.

Unit-IV: Nucleic acid
Structure and types of DNA and RNA. Structure of purines, pyrimidines nucleosides and nucleotides.

PRACTICAL:

1. Test of Carbohydrate, proteins and lipids.
2. Action of salivary amylase under optimum conditions.
3. Effect of pH, temperature and inhibitors on salivary amylase.
4. Paper chromatography of salivary amylase.

References:

- Saeger.W(1984). Principles of Nucleic acid structure. Springer -Verlag ISBN 0387907629
- Pitman, W.D.Horton(1972). The Carbohydrates. Vol.14. San Diego Academic Press p-13 ISBN 978-0-12-3A8

SEMESTER-II

MJ-2

MOLECULAR BIOLOGY

Unit-I. : DNA Replication
Mechanism of DNA replication in Prokaryotes. Replication of Circular and linear ds DNA.

Unit-II: Transcription
Mechanism of transcription of Prokaryotes and Eukaryotes.

Unit-III: Translation
Process of protein synthesis in Prokaryotes. Ribosome structure and assembly in Prokaryotes;aminoacyl tRNA synthetase; Difference between Prokaryotic and Eukaryotic translation.

Unit -IV: Genetic regulation
Gene regulation in Prokaryotes; Lac and tryptophan Operon.

Unit-V: DNA repair mechanism
Pyrimidine dimerization and mismatch repair.

PRACTICAL

Study and interpretation of electron micrographs/photography showing:
DNA replication
Transcription
Split genes

2. Quantitative estimation of RNA using Orcinol reaction.
3. Quantitative estimation of Salmon sperm DNA using colorimeter with Diphenyl amine reagent.

References:

- Cooper G.M. andRobert E .Hausman R.E . The Cell :
- DrA Molecular Approach, V Ed.

-tion , ASM Press and Sinauer
Association.

- Dr Roberts, E.D.P and De Robertis , E.M.F. (2006) Cell
and Molecular Biology. VIII
Edition. Lippincott Williams and
Wilkins , Philadelphia.
- Booker .W.M. Kleinsmith, J.J ., Hardin. J. and Berton, G.P. (2009) . The World of Cell.
VIII Edition Pearson Benjamin Cummings Publishing, San Francisco.