ST. JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM

I SEMESTER **MULTIDISCIPLINARY COURSE** Time:2 hrs/wk

POB 1001(2) **PRINCIPLES OF BIOLOGICAL SCIENCES** Marks:100

w.e.f AK - 2023-2024 (Admitted batch) **SYLLABUS**

LEARNING OBJECTIVES:

By the end of this course the learner can:

1. Acquire logic to evaluate fundamental biological concepts at various levels of biological organisation including the molecular, cellular, organismal and systems levels.

2. Communicate fundamental biological knowledge between tiers of biological organisation. 3. Apply common biological principles across all levels of biological organization.

Learning Outcomes: On completion of this course students will be able to:

1. Understand the relationship between structure and function at all levels.
2. Recognise the mechanisms underlying biological evolution, its patterns, and its significance as biology's overarching unifying principle.
3. Understand the contributions of biology to the resolution of medical, ethical, social, and environmental concerns in human affairs.

UNIT-I: Diversity of Life: 1.1 Introduction to Biology, Branches of Biology, Basic Principles of Biology 1.2 Biological Classification-Two kingdom and Five kingdom classification, Viruses, Viroid's and Lichens 1.3 Diversity in the living world, Taxonomic categories, Taxonomic aids 1.4 Plant organization-The form, structure and function of plant vegetative and reproductive organs, Classification of Plant Kingdom, 1.5 Basis of Animal Classification, Classification of Animal Kingdom .

UNIT-II Biomolecules and metabolisim 2.1 Ultra structure of cell and Cell organelles (Structure and Functions), Plant cell vs Animal cell 2.2 Plant Physiology: Photosynthesis, Respiration, Transportation, Mechanisms of Nitrogen fixation. 2.3 Plant growth and development, physiology of flowering. 2.4 Human Physiology: Digestion, Respiration, Circulation 2.5 Male and female reproductive organs, gametogenesis, fertilization.

UNIT-III: Principles of Biology 3.1 Genetics: Mendel's laws of inheritance, Genetic disorders-Colour blindness, Sickle cell anaemia. 3.2 Evolution: Geological time scale for evolution of plants and vertebrates, Origin and evolution of plants and man 3.3 Common Human Diseases: causing organism, prevention and treatment- malaria, dengue, AIDS, cancer, corona. 3.4 Common Plant Diseases: causing organism, prevention and treatment- Black spot, Leaf spots, Powdery mildew, Blight, Canker. 3.5 Biotechnology: Tools and process of recombinant DNA technology, Applications of biotechnology in agriculture, food industry, medicine and transgenic animals.

Text Books :

1. Pandey, B.P. (2013) College Botany, Volume-I, S. Chand Publishing, New Delhi.

2. Kotpal, R.L.2022. Modern textbook of zoology, Vertebrates. (Rastogi Publ., Meerut).

3. Verma P.S., Agarwal V.K., 2006. Cell biology, genetics, Molecular Biology, Evolution and Ecology. S. Chand publishers, New Delhi, India.

Reference Books :

1. Sreekrishna V. 2005. Biotechnology –I, Cell Biology and Genetics. New Age International Publ. New Delhi, India.

2. Rastogi, S.C., 2019. Essentials of animal physiology. 4th Edition. New Age International Publishers.

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