**Multidisciplinary Courses**

**w.e.f. AY 2023-24**

**SEMESTER-I**

**PRINCIPLES OF BIOLOGICAL SCIENCES**

**Code- POB1001**

**Credits: 2 2 hrs/week**

**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.

4. Learn the applications of Biotechnology

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

1. Comprehend 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. Recognize the contributions of biology to the resolution of medical, ethical, social, and environmental concerns in human affairs.

4. Illustrate the applications of Biotechnology

**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

1.3 Diversity in the living world,

1.4 Basic principles of classification of Plant and animal Kingdom

1.5 Plant organization-The form, structure and function of plant vegetative and reproductive organs,

**UNIT-II Biomolecules and metabolism**

2.1 Ultra structure of cell and Cell organelles (Structure and Functions), Plant cell vs Animal cell

2.2 Plant Physiology: Outlines of Photosynthesis and Respiration, Basic aspects of Nitrogen fixation.

2.3 Human Physiology: Outlines of Digestion, Respiration, Circulation

2.4 Male and female reproductive organs, Outlines of gametogenesis & fertilization.

**UNIT-III Principles of Biology**

3.1 Genetics: Outlines of Mendel’s laws of inheritance, Brief introduction to Genetic disorders - Colour blindness, Sickle cell anaemia.

3.2 Evolution: Origin and evolution of plants and man life, Geological time scale for evolution of plants and vertebrates (one or two theories),

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