



FACULTY OF AGRICULTURAL SCIENCES AND ALLIED INDUSTRIES

INTRODUCTORY BIOLOGY UGR-121

LECTURE- 01

INTRODUCTION

- Biology is the science of life forms and living processes.
- The living organisms interact with one another as well as with their physical and chemical environment.
- The term biology was introduced by G. R. Treviranus and Lamarck (1802).
- The living organisms occur almost in every habitat on earth.
- All living beings share certain unified and basic characteristics. These include organisation, energy utilization, regulation or homeostasis, growth, development, reproduction and adaptation.

BIODIVERSITY AND ITS IMPORTANCE

The term biodiversity (from “biological diversity”) refers to the variety of life on Earth at all its levels, from genes to ecosystems, and can encompass the evolutionary, ecological, and cultural processes that sustain life. Biodiversity includes not only species we consider rare, threatened, or endangered but also every living thing—from humans to organisms we know little about, such as microbes, fungi, and invertebrates

The value of biodiversity can also be understood through the lens of the relationships we form and strive for with each other and the rest of nature. We may value biodiversity because of how it shapes who we are, our relationships to each other, and social norms. These relational values are part of peoples’ individual or collective sense of wellbeing, responsibility for, and connection with the environment. The different values placed on biodiversity are important because they can influence the conservation decisions people make every day.

LIFE

- Living organisms show a great biodiversity and are classified into different kingdoms—Monera, Protista, Fungi, Plantae and Animalia. All of these share the following properties -
- They have definite organisation.
- They always have cellular nature so are either unicellular (e.g., Amoeba, Paramecium etc.) or multicellular (e.g., Hydra, man etc.).
- They show coordination between different parts of body to maintain homeostasis (constant internal environment) inside the body.
- They have the ability of movements and locomotion.
- They show metabolic functions in the presence of energy.
- They have the ability of growth and development.
- They have specific receptors (e.g., sense organs to receive external and internal stimuli) and specific effectors (e.g., muscles and glands to give specific response).

- They have regulatory mechanisms (e.g., nervous system and hormones in animals, and only hormones in plants) to maintain homeostasis inside the body.
- They show adaptations to their environment to increase their chances of survival.
- They show variations which help in speciation and evolution.
- They have capacity to reproduce for continuity of their race.
- They have definite life span (period from birth to death).
- They undergo ageing after adulthood and then natural death.

BRANCHES OF BIOLOGY

- Anatomy - Study of internal structure
- Phycology or Algology - Study of Algae
- Agrostology - Study of grass
- Anthology - Study of flowers
- Agronomy - Study of crops plants.
- Biochemistry - Study of organic substances, found in living organisms.
- Biophysics - Study of importance in metabolic reactions of different physical theories
- Bacteriology - Study of bacteria
- Bryology - Study of bryophytes
- Bio-metrics - Study related to different biotic reactions and their results.
- Biotechnology - Study of isolation of protoplasm and their culture
- Cytology - Study of structure and functions of cell
- Dendrology - Study of tree.
- Dendrochronology - Study of age of trees
- Embryology - Study of gametes formation, fertilization and formation of embryo
- Ecology - Study of inter-relations between living organism and their atmosphere
- Evolution - Study of different development process of living organism
- Economic botany - Study of plants of economic importance
- Exobiology - Study of presence of possible organism on other planet
- Euphenics - Study of control of heredity disease
- Floriculture - Study of culture of ornamental flowers
- Forestry - Study of forests
- Genetics - Study of heredity and variations
- Gymnology - Study of Gymnosperm
- Genetic engineering - Study of manipulation of genes for human welfare.
- Histology - Study of structure of tissues .
- Horticulture - Study of culture of garden plant, fruits and vegetables
- Karyology - Study of nucleus
- Morphology - Study of external characters of plants
- Mycology - Study of fungi
- Microbiology - Study of microorganisms
- Molecular Biology - Study of nucleic acid (DNA and RNA)

- Oncology - Study of cancer
- Physiology - Study of various organ within organisms.
- Paleobotany - Study of fossil plants
- Pedology - Study of soil