

# Unit-1

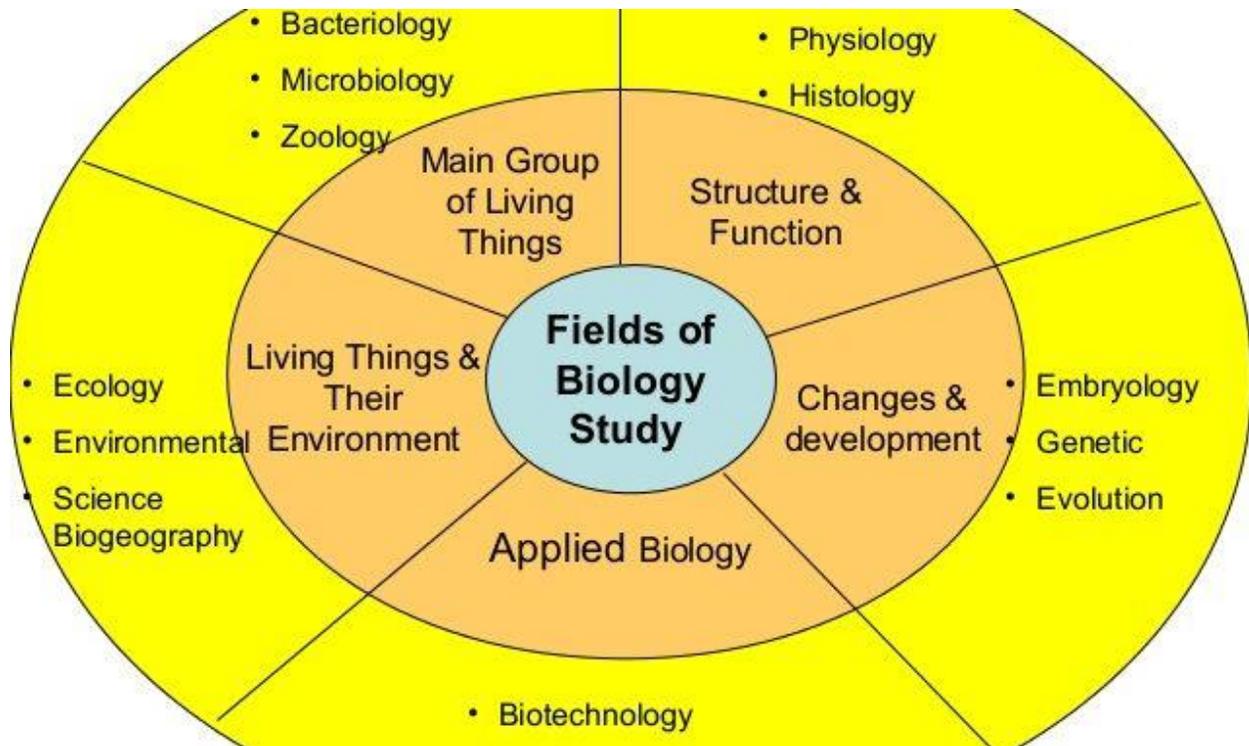
**BIOLOGY-** Biology is the natural science that studies life and living organisms, including their physical structure, chemical processes, molecular interactions, physiological mechanisms, development and evolution.

The word biology is derived from the greek words /bios/ meaning /life/ and /logos/ meaning /study/ and is defined as the science of life and living organisms. An organism is a living entity consisting of one cell e.g. bacteria, or several cells e.g. animals, plants and fungi.

Biology is the science of life. Biologists study the structure, function, growth, origin, evolution and distribution of living organisms.

## Branches of biology-

- Biochemistry is the use of chemistry in the study of living things.
- Bioengineering is the study of living things through the means of engineering.
- Biogeography is the study of the geographical distribution of living things.
- Bioinformatics is the the use of information technology for the study, collection, and storage of genomic and other biological data.
- Biomechanics is the study of the mechanics of living beings.
- Biological Earth Sciences are the use of earth sciences, such as geography, in the study of living things.
- Biomedical research is the study of health and disease.
- Biophysics is application of physics to the study of living things.
- Biological Psychology is the application of biology to the study of the human mind.
- Biosemiotics is the study of biological processes through semiotics, by applying the models of meaning-making and communication.
- Botany is the study of plants.
- Building biology is the study of the indoor living environment.
- Cell biology is the study of the cell as a complete unit.



**Scientific methods in biology-** The scientific method is a series of steps followed by scientific investigators to answer specific questions about the natural world. It involves making observations, formulating a hypothesis, and conducting scientific experiments.

## The scientific method

At the core of biology and other sciences lies a problem-solving approach called the scientific method. The scientific method has five basic steps, plus one feedback step:

Make an observation.

Ask a question.

Form a hypothesis, or testable explanation.

Make a prediction based on the hypothesis.

Test the prediction.

Iterate: use the results to make new hypotheses or predictions.

The scientific method is used in all sciences—including chemistry, physics, geology, and psychology. The scientists in these fields ask different questions and perform different tests.

However, they use the same core approach to find answers that are logical and supported by evidence.

## **Scope of biology and carrier options in Medical laboratory sciences-**

Biotechnologist.

Higher education lecturer.

Marine biologist.

Medicinal chemist.

Microbiologist.

Nanotechnologist.

Nature conservation officer.

Pharmacologist.

Anthropology:

The science of man and mankind including the study of the physical and mental constitution of man.

It also deals with the cultural development, social tradition as exhibited by them both in their past and present.

Biomedical engineering:

Branch of engineering dealing with the production of spare parts for man.

Biomedical engineers help in manufacturing of artificial limbs, heart, lungs etc. used by doctors to help impaired bodies function properly.

Biotechnology:

It deals with the use of living organisms or of substances obtained from them in industrial processes.

Food technology:

The science of processing and preservation of healthy foods.

Dairy technology: The application of science for the manufacture of milk product.

Apiculture: The rearing of honey bees, bee keeping especially for commercial purposes.

Fishery or Pisciculture: The industry of rearing and catching fish or the products of the sea, lakes, rivers or ponds.

Sericulture: The breeding and treatment of silkworms for producing raw silk.

Genetic engineering:

It involves genetic manipulations to produce an organism with a new combination of genes to improve the varieties.

Application of scientific knowledge to question civil and criminal laws is called forensic science which includes the study of finger prints, blood typing etc.

Veterinary medicine:

It deals with the study of domesticated animals and their health care.

Science dealing with the rearing of domestic fowls such as chicken, ducks, turkeys etc. is called poultry science.

Medicine:

It is the science of treating diseases with drugs or curative substances.

The science dealing with the study of nature of diseases, their causes, symptoms and effects is called pathology.

The branch of medicine involving the physical operations to cure diseases or injuries to the body is called surgery.

The science of knowledge of drugs and preparation of medicine or drugs is called pharmacology.

Care of teeth, including cleaning and polishing, removal of spoiled teeth, filling and fitting of artificial teeth is called dentistry.

Therapy:

A method of treatment of convalescents and for physically handicapped people utilizing light work of diversion, physical exercise or vocational training is called occupational therapy.

The treatment of diseases, bodily weakness or defects by physical remedies such as massage and exercise is called physiotherapy.