

Lec (1)

Biology

Definition of biology:

❖ Study of living things and their vital processes.

It is a science of life (their origin , morphology , physiology , behavior and distribution).

❖ Biology can overlaps with other field – chemistry , physics and medicine such as biochemistry , biophysics and biomedicine.

Relation of biomedical engineering and biology

Biomedical engineering

- ❖ Study biological processes and integrate or use them with engineering principles to develop solutions for a wide variety of technical problem.

How is engineering used in biology?

Engineering biology is the set of methods for designing, building, and testing engineered biological systems which have been used to manipulate information, construct materials, process chemicals, produce energy, provide food, and help maintain or enhance human health and environment.

❖ Biomedical engineers use their knowledge of engineering to create medical devices, equipment, and processes to heal, treat, or improve health conditions. While the exact duties a biomedical engineer performs day to day vary from project to project.

❖ **Some of the most common responsibilities include:**

- Design medical devices, such as pacemakers or artificial limbs
- Repair and install medical devices and equipment
- Conduct original research into existing biomedical devices and biological processes
- Train medical professionals in the use of new medical equipment

Important of biology

- 1- Help us understand the living world , function , envolve and interact.
- 2- Understanding of how all livings and non living organisms interact with each other.
- 3- Advances in medicine , agriculture , biotechnology and improvements in the quality of life.
- 4- Felid such as genetic and evolution give insight into the past and can help shape the future.
- 5- Help us understand the biodiversity.

Characteristics of living organisms

1- Respiration

Production of energy, typically with the intake of oxygen and the release of carbon dioxide from the oxidation of food.

2- Movement

Changing physical location or position e.g. walk , fly....

3- Sensitivity

The ability of an organism to respond to external stimuli.

4- Reproduction

The ability to reproduce and pass genetic information into their offspring.

5- Nutrition

Process by which organisms obtain and use the nutrients required for maintain life.

6- Excretion

Process by which metabolic wastes and get it out of the body (urea, carbon dioxide).

7- Growth and development

Young organisms grow and developed into adult (they can increase cells both in number and mass).

8- Adaptation

Change in the structure or behavior of an organisms that allow it to survive in particular environment

9- Metabolism

The chemical reactions that take place in cell of living organisms.