JHARKHAND Rai University
UGC RECOGNISED UNIVERSITY
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Lesson Plan & Tracking

Programe :B.Tech. CSE	**Session : 2022-23**	**Year :**	**Sem: 3rd Sem**
Course: 'Biological Science for Engineers			
Name of the Faculty: Apurwa Bhardwaj	**Commencement Date:19/09/2022**		**Date of Closure:**

Lecture No.	Week	Unit	Topics to be Covered	Blended Mode			Date	Duration	Tracking of Lectures	Related Course Outcome	Signature of Faculty	Signature of HoD	Remarks (if any)
				ICT Tool/Platform/ LMS	Resources	Activity							
1	1	Unit-I	To convey that Biology is as important a scientific discipline as Mathematics, Physics and Chemistry. The fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft.										
2			Mention the most exciting aspect of biology as an independent scientific discipline.Why we need to study biology? Discuss how biological observations of 18th Century that lead to major discoveries. Examples from Brownian motion and the origin of										

3			Purpose:To convey that classification per seis not what biology is all about. The underlying criterion, such as morphological, biochemical or ecological be highlighted.Hierarchy of life forms at phenomenological level.										
4	**2**	**UNIT-II**	Discuss classification based on (a) cellularity- Unicellular or multicellular (b) ultrastructure- prokaryotes or eucaryotes. (c) energy and Carbon utilization - Autotrophs,heterotrophs, lithotropes (d) Ammonia excretion – aminotelic, (e) Habitata- acquatic or										
5			terrestrial (e) Molecular taxonomy- three major kingdoms of life. A given organism can come under different category based on classification. Model organisms for the study of biology come from different groups. E.coli, S.cerevisiae										
6			To convey that " Genetics is to biology what Newton's laws are to Physical Sciences"										
7			Mendel's laws, Concept of segregation and independent assortment. Concept of allele.										

8	**3**	**UNIT-III**	Gene mapping, Gene interaction, Epistasis. Meiosis and Mitosis be taught as a part of genetics. Emphasis to be give not to the mechanics of cell division nor the phases but how genetic material passes from parent to offspring. Concepts of recessiveness and dominance.										
9			Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics.										
10	**4**	**UNIT-IV**	Purpose: To convey that all forms of life has the same building blocks and yet the manifestations are as diverse as one can imagine										
11			Molecules of life. In this context discuss monomeric units and polymeric structures										
12			Discuss about sugars, starch and cellulose										
13			Amino acids and proteins. Nucleotides and DNA/RNA.Two carbon units and lipids.										

14	**5**	**UNIT-V**	To convey that without catalysis life would not have existed on earth Enzymology:How does an enzyme catalyzereactionsHow does an enzyme catalyzereactions. Enzyme classification.										
15			Mechanism of enzyme action. Discuss at least two examples.										
16			Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis.										
17	**6**	**UNIT-VI**	Purpose: The molecular basis of coding and decoding genetic information is universal Molecular basis of information transfer.										
18			DNA as a genetic material. Hierarchy of DNA structure-from single stranded to double helix to nucleosomes.										
19			Concept of genetic code. Universality and degeneracy of genetic code.										
20			Define gene in terms of complementation and recombination.										
21			Macromolecular analysis										

22	**7**	**UNIT-VII**	Purpose: How to analyses biological processes at the reductionist level										
23			Proteins- structure and function.										
24			Hierarch in protein structure. Primary secondary, tertiary and quaternary structure.										
25			Proteins as enzymes, transporters, receptors and structural elements.										
26	**8**	**UNIT-VIII**	Purpose: The fundamental principles of energy transactions are the same in physical and biological world. Thermodynamics as applied to biological systems. Exothermic and endothermic versus endergonic and exergoinc reactions.										
27			Concept of Keq and its relation to standard free energy. Spontaneity. ATP as an energy currency. This should include the breakdown of glucose to CO2+ H2O (Glycolysis and Krebs cycle) and synthesis of glucose from CO2and H2O (Photosynthesis)										
28			Energy yielding and energy consuming reactions. Concept of Energy charge										

29	**9**	**UNIT-IX**	Concept of single celled organisms. Concept of species and strains. Identification and classification of microorganisms. Microscopy. Ecological aspects of single celled organisms. Sterilization and media compositions. Growth kinetics.										
30			Proteins- structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure. Proteins as enzymes, transporters, receptors and structural elements.										
31	**10**		REVISION										
32			REVISION										
33			REVISION										