

Satyug Darshan Institute of Engineering and Technology

Lesson Plan / Teaching Plan / Lecture Plan with Progress: B.Tech. CSE – 5th Semester : 2025-26

Course Name (Code): Biology (BSC-01)

Faculty Name-Dr Mansi Rastogi

Topics / lectures are arranged in sequence - same - as to be taught in the class. Maintain data related to "Date" in its hard copy					
S. No	Lecture No	Topic Description	Teaching Pedagogy	Reference Material	Remarks, if any
1	1	Bring out the fundamental differences between science and engineering by drawing a comparison between eye and camera, Bird flying and aircraft.	Board	T1	
2	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.	Board	T1	
3	3	Examples from Brownian motion and the origin of thermodynamics by referring to the original observation of Robert Brown and Julius Mayor. These examples will highlight the fundamental importance of observations in any scientific enquiry.	Board	T1	
4	4	Revision Unit1			
5	5	Hierarchy of life forms at phenomenological level. A common thread weaves this hierarchy Classification. Discuss classification based on (a) cellularity- Unicellular or multicellular	Board	T1	
6	6	Energy and Carbon utilisation -Autotrophs, heterotrophs, lithotrophs (b) ultrastructure- prokaryotes or eucaryotes.	Board	T1	
7	7	Ammonia excretion – aminotelic, uricotelic, ureotelic (c) Habitatacquatic or terrestrial	Board	T1	
8	8	Molecular taxonomy- three major kingdoms of life. A given organism can come under different category based on classification.	Board	T1	
9	9	Model organisms for the study of biology come from different groups. <i>E.coli</i> , <i>S.cerevisiae</i> , <i>D. Melanogaster</i> , <i>C. elegance</i> , <i>A. Thaliana</i> , <i>M. Musculus</i>	Board	T1	
10	10	Revision Unit 2			
11	11	To convey that "Genetics is to biology what Newton's laws are to Physical Sciences" Mendel's laws, Concept of segregation and independent assortment.	Board	T1	
12	12	Concept of allele. Gene mapping, Gene interaction, Epistasis,	Board+PPT	T1	
13	13	Meiosis and Mitosis	Board+PPT	T1	
14	14	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.	Board+PPT	T1	
15	15	Concept of mapping of phenotype to genes. Discuss about the single gene disorders in humans. Discuss the concept of complementation using human genetics	Board+PPT	T1	
16	16	Revision Unit 3			
17	17	To convey that all forms of life has the same building blocks and yet the manifestations are as diverse as one can imagine	Board+PPT	T1	
18	18	Molecules of life. In this context discuss monomeric units and polymeric structures.	Board+PPT	T1	
19	19	Sugars, starch and cellulose.	Board+PPT	T1	
20	20	Amino acids and proteins. Nucleotides and DNA/RNA. Two carbon units and lipids	Board+PPT	T1	
21	21	Revision Unit 4			
22	22	Enzymology: How to monitor enzyme catalysed reactions. How does an enzyme catalyse reactions? Enzyme classification. Mechanism of enzyme action. Discuss at least two examples.	Board+PPT	T1	
23	23	Enzyme kinetics and kinetic parameters. Why should we know these parameters to understand biology? RNA catalysis.	Board+PPT	T1	
24	24	Revision Unit 5			
25	25	Molecular basis of information transfer. DNA as a genetic material. Hierarchy of DNA structure from single stranded to double helix to nucleosomes.	Board+PPT	T1,T2	
26	26	Concept of genetic code. Universality and degeneracy of genetic code. Define gene in terms of complementation and recombination.	Board+PPT	T1,T2	
27	27	Revision Unit 6		T1,T2	
28	28	Proteins- structure and function. Hierarch in protein structure. Primary secondary, tertiary and quaternary structure.	Board+PPT	T1,T2	
29	29	Proteins as enzymes, transporters, receptors and structural elements.	Board+PPT	T1,T2	
30	30	Revision Unit 7			

31	31	Thermodynamics as applied to biological systems. Exothermic and endothermic versus endergonic and exergonic reactions	Board+PPT	T1,T2,T3	
32	32	Concept of Keq and its relation to standard free energy.	Board+PPT	T1,T2,T3	
33	33	Spontaneity. ATP as an energy currency.	Board+PPT	T1,T2,T3	
34	34	This should include the breakdown of glucose to CO ₂ + H ₂ O -Glycolysis	Board+PPT	T1,T2,T3	
35	35	Krebs cycle and synthesis of glucose from CO ₂ Photosynthesis	Board+PPT	T1,T2,T3	
36	36	Energy yielding and energy consuming reactions. Concept of Energy Charge.	Board+PPT	T1,T2,T3	
37	37	Revision unit 8			
38	38	Concept of single celled organisms. Concept of species and strains.	Board+PPT	T1,T2,T3	
39	39	Identification and classification of microorganisms. Microscopy.	Board+PPT	T1,T2,T3	
40	40	Ecological aspects of single celled organisms. Sterilization and media compositions.	Board+PPT	T1,T2,T3	
41	41	Growth kinetics.	Board+PPT	T1,T2,T3	
42	42	Revision Unit 9			

Study Material / Books / Web-resources / Online Courses Links etc.

S. No.	Description
1	“Biology: A global approach” Campbell, N. A.; Reece, J. B.; Urry, Lisa; Cain, M, L.; Wasserman, S. A.; Minorsky, P. V.; Jackson, R. B. Pearson Education Ltd 2.
2	“Outlines of Biochemistry” , Conn, E.E; Stumpf, P.K; Bruening, G; Doi, R.H. John Wiley and Sons
3	Biology for Engineers-Rajiv Singhal , Gaurav Agarwal & Ritu Bir