

MAHARANA PRATAP MAHAVIDYALAYA, JUNGLE DHUSAR, GORAKHPUR**LESSON PLAN 2025-26 Course Code: BOT 303****Course Title: Experiments in Physiology, Biochemistry & Molecular Biology****Credits: 0+2**

DATE	LECTURE NO	TEACHER	UNIT	TOPIC
01.08.2025	1	Dr. AKS/ Dr. AKG	I Plant water relation, Mineral Nutrition and translocation in phloem	Determination of osmotic potential of plant cell sap by plasmolytic method using leaves of Rhoeo / Tradescantia.
02.08.2025	2	Dr. AKS/ Dr. AKG		Osmosis – by potato osmoscope experiment
08.08.2025	3	Dr. AKS/ Dr. AKG		Experiment for demonstration of Transpiration by Four-Leaf Experiment: Study of mineral deficiency symptoms using plant material/photographs.
22.08.2025	4	Dr. AKS/ Dr. AKG		Study of mineral deficiency symptoms using plant material/photographs.
23.08.2025	5	Dr. AKS/ Dr. AKG	II Nitrogen Metabolism, Photo Synthesis & Respiration	A basic idea of chromatography: Principle, paper chromatography and column chromatography; demonstration of column chromatography. Separation of plastidial pigments by solvent and paper chromatography.
29.08.2025	6	Dr. AKS/ Dr. AKG		Determination of the RQ of germinating seeds. Effect of light intensity on oxygen evolution in photosynthesis using Wilmott's bubble
30.08.2025	7	Dr. AKS/ Dr. AKG	III Plant Development, Movements, Dormancy & Responses	Measurement of growth — Arc and Liver Auxonometer
06.09.2025	8	Dr. AKS/ Dr. AKG		To study the phenomenon of seed germination (effect of light).
12.09.2025	9	Dr. AKS/ Dr. AKG		Test of seed viability by TTC method

13.09.2025	10	Dr. AKS/ Dr. AKG	IV Techniques for biochemical analysis	Weighing and Preparation of solutions - percentage, molar & normal solutions, dilution from stock solution etc.
19.09.2025	11	Dr. AKS/ Dr. AKG		Separation of amino acids by paper chromatography. Estimation of reducing sugar by anthrone method,
20.09.2025	12	Dr. AKS/ Dr. AKG		Qualitative analysis of lipids
26.09.2025	13	Dr. AKS/ Dr. AKG		qualitative analysis of amino acid and protien quantitative analysis of nucleic acid
27.09.2025	14	Dr. AKS/ Dr. AKG	V Genetic material	Instruments and equipments used in molecular biology.
03.10.2025	15	Dr. AKS/ Dr. AKG	V Genetic material	Preparation of LB medium and cultivation of E. Coli Isolation of genomic DNA Isolation of DNA from Plants
04.10.2025	16	Dr. AKS/ Dr. AKG		Examination of the puritynof DNA by Agarose Gel Electrophoress Quantification of DNA by UV
10.10.2025	17	Dr. AKS/ Dr. AKG		spectrophotometer Estimation of DNA by diphenylamine method.
11.10.2025	18	Dr. AKS/ Dr. AKG	VI Preparation of models/ charts:	1. Study of experiments establishing nucleic acid as genetic material (Avery et al, Griffith's, Hershey & Chase's and Fraenkel & Conrat's experiments)through photographs
24.10.2025	19	Dr. AKS/ Dr. AKG		3. Study of DNA replication through photographs: Modes of replication – Rolling circle, Theta and semi- discontinuous ; Semiconservative model of replication (Messelson and Stahl's experiment); Telomerase assisted end- replication of linear DNA

25.10.2025	20	Dr. AKS/ Dr. AKG		4. Study of structures of : tRNA (2D and 3D); prokaryotic RNA polymerase and eukaryotic RNA polymerase II through photographs Understanding the regulation of lactose (lac) operon (positive & negative regulation) and tryptophan (trp) operon (Repression and De-repression & Attenuation) through photographs.
31.10.2025	21	Dr. AKS/ Dr. AKG	VII Genetic Engineering	2. Construction of restriction map of circular and linear DNA from the data provided.
01.11.2025	22	Dr. AKS/ Dr. AKG		Restriction digestion and gel electrophoresis of plasmid DNA (demonstration/ photograph).
07.11.2025	23	Dr. AKS/ Dr. AKG		Restriction digestion of plasmid DNA - Demonstration of PCR
08.11.2025	24	Dr. AKS/ Dr. AKG	VIII Applications of Genetic engineering	ELISA test Viability tests of cells
14.11.2025	25	Dr. AKS/ Dr. AKG		Study of methods of gene transfer through photographs: Agrobacterium mediated, direct gene transfer by electroporation, microinjection, microprojectile bombardment.
15.11.2025	26	Dr. AKS/ Dr. AKG		2. Study of steps of genetic engineering for production of Bt cotton, Golden rice, Flavr Savr tomato through photographs.