

K.T.S.P. MANDAL'S
SAHEBRAOJI BUTTEPATIL MAHAVIDYALAYA
 RAJGURUNAGAR


TEACHING PLAN -2019-20
SEMESTER-II
S.Y.B.Sc.

Subject: MB – 221: BACTERIAL GENETICS

Teacher Name: Prof. S.S.Belhekar

Month	Unit	Topics	No.of Lectures
December 2019 - Janaury 2020	1	UNDERSTANDING MOLECULES OF HEREDITY a. RNA world and shift to DNA world with time b. Discovery of transforming material (hereditary material): Griffith's experiment c. Evidence for nucleic acid as genetic material i. Avery and MacLeod experiment ii. Gierer and Schramm / Fraenkel-Conrat & Singer experiment (TMV virus) iii. Hershey & Chase experiment d. Prokaryotic genome organization e. Concept of Gene, basic structure of B form of DNA, Properties of nucleotides related with DNA stability f. Comparative account of different forms of DNA).	10
Janaury- Febraury - 2020	2	DNA REPLICATION AND EXPRESSION a. DNA replication i. Messelson and Stahl's experiment (semiconservative) ii. Mechanisms of DNA replication: Theta model (semi-discontinuous), Cairns' experiment, rolling circle model (plasmid DNA, λ phage DNA) b. Gene organization and expression i. Properties of genetic code ii. Basic mechanism of transcription iii. Basic mechanism of translation.	13

Febraury – march 2020	3	MUTATIONS AND REVERSIONS a. Spontaneous mutations i. Occurrence and Mechanisms ii. Fluctuation test b. Mechanisms of induced mutations i. Base pair substitution (Transitions, Transversions), Base analogues (2amino purine, 5bromo uracil), HNO ₂ , Alkylating agents (ethyl methyl sulphonate) ii. Frame shift mutations (Insertions and deletions), Intercalating agents (EtBr, acridine orange), Cross linking agents (Psorolin, mitomycin), UV rays, X rays. Biological mutagens (bacteriophage μ , transposomes). c. Types of mutations: Nonsense, Missense, Silent, Null, Conditional lethaltemperature sensitive, amber, leaky& non leaky d. Isolation of Mutants: Replica plate technique e. Reversion: i. True reversion ii. Suppression (intragenic and intergenic).	18
March 2020	4	PLASMID GENETICS a. Structure and Properties of plasmids b. Types of plasmids c. Plasmid replication d. Plasmid incompatibility e. Plasmid curing f. Plasmid amplification	7



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SEMESTER-II
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Subject: MB – 222: AIR AND WATER MICROBIOLOGY

Teacher Name: Prof. Indais A.A.

Month	Unit	Topics	No.of Lectures
December 2019 - January 2020	1	AIR MICROBIOLOGY a. Air flora i. Transient nature of air flora ii. Droplet, droplet nuclei, and aerosols b. Air pollution: Chemical pollutants, their sources in air and effects on human health c. Methods of Air sampling and types of air samplers i. Impaction on solids ii. Impingement in liquid iii. Sedimentation iv. Centrifugation v. Precipitation vi. Thermal Precipitation d. Air sanitation: Physical and chemical methods e. Air borne infections	10
February – March 2020	2	WATER MICROBIOLOGY a. Types of water: surface, ground, stored, distilled, mineral and de-mineralized water b. Water purification methods, Bacteriological standards of potable water Maharashtra pollution control board (MPCB), Central pollution control board (CPCB), Bureau of Indian standards (BIS) World health Organization (WHO) c. Indicators of faecal pollution; i. Escherichia coli ii. Bifidobacterium i ii. Streptococcus faecalis iv. Clostridium perfringens v. New indicators: Campylobacter and Pseudomonas d. Water borne Infections e. Bacteriological analysis of water for potability i. Presumptive coliform count ii. Confirmed test iii. Completed test	38

	<ul style="list-style-type: none"> iv. Membrane filter technique f. Sewage and Waste Water 1. Analysis of waste water <ul style="list-style-type: none"> i. Physic chemical parameters: pH, temperature, total solids, suspended solids, Chemical Oxygen Demand(C.O.D.) ii. Biological parameters: B.O.D., Toxicity (Fish bioassay) iii. Industrial water pollutants, their ecological effects and health hazards (Biomagnification and eutrophication) 2. Methods of effluent treatment – Primary, secondary, tertiary treatment methods 3. Recycling of waste water and sludge 4. Solid waste management <ul style="list-style-type: none"> i. Raw materials ii. Organisms involved and their activity iii. Biochemical mechanisms of Biomethanation. iv. Types of anaerobic digesters. v. Applications of biogas (Methane) Eijkman test v. Membrane filter technique 	
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Prof. Indais A.A.
Subject Teacher