

To

The Principal

Sahebraoji Butte Patil Mahavidyalaya,

Rajgurunagar

Subject :- Teaching plan of F.Y.B.Sc. (Microbiology) is as follows:

FIRST TERM: PAPER II

Basic techniques in Microbiology

Sr. No.	Topic	Duration
Credit One	I. Units of measurement – Introduction to Modern SI units Microscopy: 1. Bright field microscopy: <ul style="list-style-type: none">• Electromagnetic spectrum of light• Structure, working of and ray diagram of a compound light microscope; concepts of magnification, numerical aperture and resolving power.• Types, ray diagram and functions of – condensers (Abbe and cardioid) eyepieces and objectives• Concept of aberrations in lenses - spherical, chromatic, comma and astigmatism 2. Principle, working and ray diagram of <ul style="list-style-type: none">i. Phase contrast microscopeii. Fluorescence Microscopyiii. Electron Microscopy – TEM, SEM	July 2019
	II. Staining Techniques: <ul style="list-style-type: none">• Definition of Stain; Types of stains (Basic and Acidic), Properties and role of Fixatives, Mordants, Decolourisers and Accentuators• Monochrome staining and Negative (Relief) staining• Differential staining - Gram staining and Acid-fast staining• Special staining- Capsule, Cell wall, Spore,	July 2019 August 2019

	Flagella, Lipid granules, metachromatic granules	
Credit Two	Sterilization and Disinfection 1. Sterilization <ul style="list-style-type: none"> • Physical Agents - Heat, Radiation, Filtration • Checking of efficiency of sterilization (Dry and Moist) – Biological and Chemical Indicators 2. Disinfection: <ul style="list-style-type: none"> • Chemical agents and their mode of action - Aldehydes, Halogens, Quaternary ammonium compounds, Phenol and phenolic compounds, • Heavy metals, Alcohol, Dyes, Detergents and Ethylene oxide. • Characteristics of an ideal disinfectant • Checking of efficiency of disinfectant - Phenol Coefficient (Rideal-Walker method) 	August 2019 September 2019
	Revision and question paper solving	October 2019

S. S. Belhekar

Prof. Belhekar S.S.

Department of Microbiology

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Subject :- Teaching plan of F.Y.B.Sc. (Microbiology) is as follows:

FIRST TERM : PAPER I: Introduction to Microbial World

Sr. No.	Topic	Duration
Credit One	<p>Amazing world of Microbiology <u>Development of microbiology as a discipline -</u> Discovery of microscope and Microorganisms (Anton von Leeuwenhoek and Robert Hooke), Abiogenesis v/s biogenesis (Aristotle's notion about spontaneous generation, Francesco Redi's experiment, Louis Pasteur's & Tyndall's experiments)</p> <p><u>Golden Era of Microbiology</u> Contributions of - Louis Pasteur (Fermentation, Rabies, Pasteurization and Cholera vaccine-fowl cholera experiment) Robert Koch (Koch's Postulates, Germ theory of disease, Tuberculosis and Cholera-isolation and staining techniques of causative agent) Ferdinand Cohn (Endospore discovery), Discovery of viruses (TMV and Bacteriophages), River's Postulates Contribution of Joseph Lister (antiseptic surgery), Paul Ehrlich (Chemotherapy), Elie Metchnikoff (Phagocytosis), Edward Jenner (Vaccination) and Alexander Fleming (Penicillin) in establishment of fields of medical microbiology and immunology, Discovery of Streptomycin by Waksman Contribution of Martinus W. Beijerinck (Enrichment culture technique, Rhizobium), Sergei N. Winogradsky (Nitrogen fixation and Chemolithotrophy) in the development of the field of soil microbiology</p> <p><u>Modern Era of Microbiology</u>Carl Woese classification based on 16S rRNA Signification and Application of Human Microbiome, Nano-biotechnology and Space Microbiology</p>	July 2019

Credit Two	Types of Microorganism and their differentiating characters -- Prokaryotes, Eukaryotes, three domain and five domain system of classification --Bacteria (Eubacteria and Archaeobacteria) --Protozoa --Fungi --Algae- -Actinomycetes --Viruses, Viroids and Prions --Actinomycetes Beneficial and Harmful effects of microorganisms: Medical Microbiology (Enlist diseases caused by various microorganisms, vaccines and antibiotics) Environmental Microbiology (Eutrophication, red tide, Sewage treatment, bioremediation) Food and Dairy Microbiology (Food spoilage, food borne diseases, Probiotics and fermented food) Agriculture Microbiology (Plant diseases and Biofertilizers and Bio-control agents) Industrial Microbiology (Production of antibiotics, enzymes, solvents and contaminants-bacteria and phages) Immunology (Normal flora, Three lines of defence)	August 2019 September 2019
	Revision and question paper solving	October 2019



Prof. Mrs. A. A. Indais

Department of Microbiology