

Annexure 2
Detailed Syllabus for Each Course

Semester: I	Course No.: 111	Course Code: -- MIM-111 (T)
Credits: 4		Course Title: Introduction to Microbial world
		Course Category: -Major

Course Outcomes: On successful completion of the course the learner will be able to

CO#	COGNITIVE ABILITIES	COURSE OUTCOMES
CO111.1	REMEMBERING	Learn about the origin of life and the evolution of the microbiology field. Contributions of scientists pertaining to microbiology and different areas of microbiology.
CO111.2	UNDERSTANDING	Learn about the morphological and differential characteristics of different groups of microorganisms.
CO111.3	APPLYING	Define and understand various terms and techniques involved in fundamental principles of microscopy.
CO111.4	ANALYSING	Understand stains and dye chemistry, know about fixatives and mordents Learn different staining procedures and apply them in the laboratory.
CO111.5	EVALUATING	--

Unit No.	Unit Contents	Sessions Allotted
1	Origin and History of the Microbial World: Origin and history of the microbial world A. Origin of Microbial Life i. Biogenesis Vs Abiogenesis (Hypothesis and experiments) ii. Miller's experiments, Ubiquitous nature of microbial life. iii. Development from simple to complex life forms. B. History of Microbiology Significance of Scientific contributions in the development in Microbiology as a discipline: i. Early contributions: Robert Hook, Anton Van Leeuwenhoek, Louis Pasteur, Robert Koch, John Tyndall. ii. Scientific contribution leading to diversification of Microbiology: Recent milestone discoveries in the field of microbiology. C. Medical Microbiology and Immunology: Edward Jenner, Paul Ehrlich, Ellie Metchnikoff, Joseph Lister D. Food Microbiology and Fermentation: Alexander Fleming, Louis Pasteur, Selman Waksman E. Soil Microbiology: Sergei Winogradsky, Martinus Beijerinck F. Microbial Genetics: Watson and Crick, Hargobind Khurana, Griffith, Avery, McCarty, and Macloed G. Avenues of Microbiology	15
2	Introduction to the Microbial world: A. Distribution in nature. Different habitat: i. Terrestrial- soil and other animals, plants ii. Aquatic – Fresh and Marine water iii. Atmosphere- Air iv. Extremophiles – Temperature, Salt, Anaerobiosis, Pressure	15

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	B. Major groups of microorganisms. i. Bacteria and Actinomycetes ii. Yeast and Fungi iii. Algae iv. Viruses v. Viroids and prions vi. Protozoa	
3	Microscopy: A. Introduction i. History of microscopy ii. Terms in microscopy – Magnification, Refractive index, Numerical aperture, Resolving power iii. Aberrations in lenses B. Principle, working, and applications of i. Bright field microscopy. ii. Darkfield microscopy iii. Phase contrast microscopy iv. Fluorescence microscopy v. Introduction to Electron microscopy – SEM, TEM	15
4	Stains and Staining: 4.1- Dye/ Stain chemistry. 4.2- Importance of Staining. 4.3- Physical and Chemical principles of staining. 4.4- Staining procedures – Wet mount and dry smear preparations. 4.5- Role of Fixatives, Mordents and Intensifiers. 4.6- Simple, Differential and Structural staining.	15