

St. Aloysius' College (Autonomous) Jabalpur, M.P.
 Department of Botany and Microbiology
B.Sc. II Semester Industrial Microbiology
 Fundamentals of Industrial Microbiology
 Paper— / Major

Format for Syllabus of Theory Paper

Part A – Introduction			
Program: Certificate	Class: B.Sc.	Semester: II	Session: 2022-2023
Subject: Industrial Microbiology			
1	Course Code	S1INMB2T	
2	Course Title	FUNDAMENTALS OF INDUSTRIAL MICROBIOLOGY	
3	Course Type (Core Course/ Elective/ Generic Elective/ Vocational/.....)	CORE COURSE	
114	Pre-requisite (if any)	To study this course, a student must have had the subject Biology in class/12th	
5	Course Learning Outcome (CLO)	To understand the role and significance of microorganisms. Be able to identify and classify the important microorganisms. To understand contributions of important scientists in the field.	
6	Credit Value	4	
7	Total Marks	Max. Marks: 40+60	Min. Passing Marks: -
Part B – Content of the Course			
Total No. of Lectures- Tutorials- Practical (in hours per week): 60 hrs			
L-T-P:			
Unit	Topic	No. of Lectures	
1	HISTORY AND SCOPE 1.1 Development of Industrial Microbiology 1.2 Germ Theory of Disease 1.3 Scope and Application of Industrial Microbiology in human welfare. 1.4 Contribution of – A.V. Leeuwenhoek, Alexander Fleming, Louis Pasteur, Robert Koch, Edward Jenner, Joseph Lister. 1.5 Development of various Microbiological techniques and Golden Era of Industrial Microbiology.	10 hrs	
2	MICROBIAL DIVERSITY: A 2.1 Systems of Classification – Binomial Nomenclature, Whittaker's five kingdom, Carl Woese's three domain classification system and their utility. 2.2 VIRUS: Classification, General characteristics, Structure and Reproduction of viruses. 2.3 Viroids and Prions 2.4 Life cycle of RNA and DNA virus, Lytic cycle and	14 hrs	

	Lysogeny 2.5 BACTERIA: General characteristics 2.6 Classification, Ultra structure and Reproduction of bacteria 2.7 Role of bacteria in Industries.	
3	MICROBIAL DIVERSITY: B 3.1 Bacteria with unusual properties: General characteristics, occurrence, reproduction and economic importance of the following:- <i>Cyanobacteria, Mycoplasma, Rickettsia and Actinomycetes.</i> 3.2 Beneficial and harmful microbes and their role in daily life 3.3 Archaea- habit and general morphological characters 3.4 Important Representative of Archaea- Methanogens and thermophiles.	14 hrs
4	MICROBIAL DIVERSITY: C (EUKARYOTIC MICROORGANISMS) 4.1 Morphological features, classification and characteristics of Myxomycetes (Slime Mould) 4.2 Some microbiologically important Micro Fungi – <i>Rhizopus, Mucor, Neurospora, Aspergillus, Penicillium, Yeast and Agaricus.</i> 4.3 General account of Microbiologically important Algae. 4.4 Role of Fungi in Medicines and in Industries.	12 hrs
5	APPLICATIONS OF MICROBES IN INDUSTRIAL MICROBIOLOGY: 5.1 Application in human therapeutics. 5.2 Agriculture (Biofertilizers and Mycorrhizae) 5.3 Environmental and Food Technology. 5.4 Use of Prokaryotic and Eukaryotic microorganisms in Biotechnological applications. 5.5 Genetically engineered microbes for Industrial application. 5.6 Alternative source of Energy.	10 hrs

Keywords/ Tags: History and diversity of micro-organisms

Part C – Learning Resources

Text Books, Reference Books and Other books

Suggested Readings:

1. Microbiology- Pelczar, Chan and Kreig, Ingrahm.
2. General microbiology- Stainier, Ingharam, Wheelis and Painter.
3. Biology of Microorganisms- Brook and Madigan.
4. Fundamental Principles of Bacteriology- A.J. Salle.
5. Introduction to Microbiology- Ingraham and Ingraham.
6. Tools and Techniques in Microbiology by Nath and Upadhyay.
7. Powar C.B. and H.F. Dagainawa (2003). General Microbiology Vol.2; Himalaya Publishing

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