

Lecture Plan		
Name of the college: Government College of Arts, Science and Commerce, Sanquelim, Goa.		
Name of Faculty: Ms. Shubha Shivdas Kauthankar	Subject: Botany	
Paper code: BOT 302- Microbiology and Plant Pathology	Program: T.Y.B.Sc.	Division: -
Academic year: 2025- 2026	Semester: V	Total Lectures: 45
Course Objectives: 1. The course deals with basic and advanced concepts of microbiology and plant pathology. 2. It aims to create awareness of the occurrence and economic value of various microbes; their interactions and impact on living organisms. 3. The laboratory exercises provide basic skills in isolation and handling of microorganisms and its relevant applications.		
Course Outcome: 1. Acquire the knowledge of basic and advance concepts used in Microbiology and Plant Pathology 2. Discuss the significance of microorganisms. 3. Describe methods of Microbe preservation. 4. Diagnose common plant diseases and device control measures.		
Student Learning Outcome: 1. Gain knowledge of sterilization methods, biohazards and biosafety measures. 2. Gain knowledge of methods for cultivation, preservation and maintenance of microbial cultures. 3. Understand the role and relevance of beneficial microorganisms and their applications in day to day life. 4. Understand the fundamental basis of plant-microbe interaction that leads to plant diseases and measures to be adopted for plant health management. 5. Acquire skills in isolation and handling of microbes.		

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
June 2025	23/06/2025	28/06/2025		Module 1: Introduction and methods in microbiology Introduction to microbiology:	To enlist the biosafety hazards in the laboratory.	Powerpoint presentation	Dubey, R.C. and Maheshwari, D.K. 1999. A Text Book of Microbiology
				Aseptic technique and concept of sterilization; physical and chemical methods of sterilization			
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June 2025 - July 2025	30/06/2025	05/07/2025		Biosafety levels and biohazards in the laboratory	To list the types of media used in microbiology	Powerpoint presentation	Sharma, K. 2011. Text Book of Microbiology
				Disposal of laboratory wastes and cultures.			
				Methods in microbiology: Types and preparation of culture media			
July 2025	07/07/2025	12/07/2025		Methods of obtaining pure cultures of micro-organisms (streak plate, spread plate and pour plate)	To draw a labelled bacterial growth curve.	Powerpoint presentation	Sambamurty, A.V.S.S. 2006. Text Book of Plant Pathology
				Methods of isolating micro-organisms (streak plate, spread plate and pour plate);			
				enumeration of micro-organisms (direct and indirect methods			

July 2025	14/07/2025	19/07/2025		Bacteriological determination of potability of water (standard multiple tube fermentation test)	To study the diversity of microbes in atmosphere.		Mehrotra, R.S. 1995. Plant Pathology
				Membrane filtration technique			
				Bacterial motility;			
July 2025	21/07/2025	26/07/2025		Bacterial growth curve	To study the diversity of microbes in water and enlist the methods of purification of water.		Pelczar, M.J. and Chan, E.C.S. 1972. Laboratory Exercises in Microbiology
				Maintenance and preservation of microbial cultures: Methods of preservation of microbial cultures (periodic transfer, lyophilization)			
				Methods of preservation of microbial cultures (use of mineral oil and liquid nitrogen); culture collection centers (culture banks) and their importance.			
July- August 2025	28/07/2025	02/08/2025		Module 2: Applications of micro-organisms Role of micro-organisms in production of fermented food.	To list the application of microbial cultures in dairy products.		
				Role of micro-organisms in production dairy products (bread, yoghurt and cheese)			
				organic acids (citric acid and vinegar)			

August 2025	04/08/2025	09/08/2025		Alcoholic beverages made from grapes	To study the role of microorganisms in alcohol preparation.	Powerpoint presentation
				Alcoholic beverages made from cashew fruit juice.		
				Antibiotics (penicillin and streptomycin).		
August 2025	11/08/2025	16/08/2025		Role of micro-organisms in decomposition of plant residues,	To list and photograph common plant diseases	
				Bioremediation, Micro-organisms as indicators of water pollution.		
				production of biogas and biodegradable plastics.		
August 2025	18/08/2025	23/08/2025		Module 3: Introduction to plant pathology, Classification of plant diseases	To collect plant samples infected with fungal pathogens.	
				Disease symptoms caused by bacterial, pathogens.		
				Disease symptoms caused by fungal pathogens		
August 2025	25/08/2025	30/08/2025		Disease symptoms caused by viral pathogen.	-	

September 2025	02/09/2025	06/09/2025		Pathogen attack and plant defense mechanisms:		
				Stages of disease establishment: The disease cycle		
				Disease triangle; plant disease epidemics,		
September 2025	08/09/2025	13/09/2025		monocyclic and polycyclic pathogens.	To study examples of common plant disease epidemics	
				Transmission and spread of plant pathogens.		
				Structural defense mechanisms in plants (pre-existing and induced).		
September 2025	15/09/2025	20/09/2025		Biochemical defense mechanisms in plants (pre-existing and induced).	To enlist methods of plant disease management	
				Physical plant disease management:		
				Cultural plant disease management:		
Septem ber 2025	22/09/2025	27/09/2025		Biological and IPM systems of plant disease management:		
				Biopesticides; development of transgenics for disease management.		

October 2025	28/09/2025	04/10/2025		Molecular diagnosis - identification of genes and specific molecules in disease development (DNA and protein based diagnostic kits).			
October 2025	06/10/2025	11/10/2025		Molecular diagnosis - identification of genes and specific molecules in disease development (DNA and protein based diagnostic kits).	To study the role of remote sensing in plant disease forecasting.	Powerpoint presentation	
				Computer simulation of epidemics and disease forecasting			
				Use of remote sensing and image analysis in plant pathology			
October 2025	13/10/2025	18/10/2025		Revision	-		

*** Assessment Rubrics**

Component	Max Marks
ISA 1	7.5
ISA 2	7.5
ISA 3	7.5
Practical	25
Project	-
Semester End Exam	60