

Semester Lecture Plan (Theory)

Name of the college: Government College of Arts, Science and Commerce, Sanquelim		
Name of Faculty: Dr. Tanvi Nitin Prabhu	Subject: Botany	
Paper code: BOT 302	Program/Course: B.Sc (Botany)	Division: A
Academic Year: 2026-27	Semester: V	Total Lectures: 45
Course Objectives: 1. Provide knowledge of basic and advanced concepts in microbiology and plant pathology. 2. Impart skills in various microbiological techniques, safety measures in the laboratory, role of micro-organisms in diverse applications and adoption of strategies for plant disease detection and management 3. Provide training in basic skills in isolation and handling of micro-organisms and their preservation.		
Expected Course Outcome: On completion of the course, students will be able to: 1. Recall methods of sterilization and understand the biohazards in a microbiology laboratory and biosafety measures to be adopted. 2. Explain plant diseases, defense mechanisms in plants and conventional as well as modern strategies for detection and management of plant disease. 3. Analyze the role of micro-organisms in various fermentation processes, decomposition, bioremediation, water pollution and in production of biogas and biodegradable plastics 4. Apply skills of basic microbiological techniques in testing water samples for presence of micro-organisms and identification of various diseases and causal agents of important plant diseases.		
Student Learning Outcome: On completion of the course, students will be able to: 1. Recall methods of sterilization and understand the biohazards in a microbiology laboratory and biosafety measures to be adopted. 2. Explain plant diseases, defense mechanisms in plants and conventional as well as modern strategies for detection and management of plant disease. 3. Analyze the role of micro-organisms in various fermentation processes, decomposition, bioremediation, water pollution and in production of biogas and biodegradable plastics 4. Apply skills of basic microbiological techniques in testing water samples for presence of micro-organisms and identification of various diseases and causal agents of important plant diseases.		

Month	Lectures		No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
	From:	To:					
June 2026	24.06.2026	27.06.2026	01	Introduction to BOT 302		Chalk and board/PPT	
June 2026- July 2026	29.06.2026	04.07.2026	03	Aseptic technique and concept of sterilization			Sharma, K (2011). Text Book of Microbiology. Anne Books Pvt. Ltd., New Delhi.
				Aseptic technique and concept of sterilization			
				Biosafety levels and biohazards in the laboratory			
July 2026	06.07.2026	11.07.2026	03	Instruments used in microbiology		Chalk and board/PPT	
				Physical and chemical methods of sterilization			
July 2026	13.07.2026	18.07.2026	03	Biosafety levels and biohazards in the laboratory		Chalk and board/PPT	
				Biosafety levels and biohazards in the laboratory			
				Disposal of laboratory wastes and cultures.			
July 2026	20.07.2026	25.07.2026	03	Types and preparation of culture media; methods of obtaining pure cultures of micro-organisms (streak plate, spread plate and pour plate)		Chalk and board/PPT	
				Types and preparation of culture media; methods of obtaining pure cultures of micro-organisms (streak plate, spread plate and pour plate)			
				enumeration of micro-organisms (direct and indirect methods)			

July 2026 – August 2026	27.07.2026	01.08.2026	03	enumeration of micro-organisms (direct and indirect methods)		Chalk and board/PPT	
				bacteriological determination of potability of water (standard multiple tube fermentation test and membrane filtration technique)			
				ISA 01 (Assignment)			
August 2026	03.08.2026	08.08.2026	03	bacteriological determination of potability of water (standard multiple tube fermentation test and membrane filtration technique)		Chalk and board/PPT	
				bacterial motility; bacterial growth curve			
				Methods of preservation of microbial cultures (periodic transfer, lyophilization, use of mineral oil and liquid nitrogen);			
August 2026	10.08.2026	15.08.2026	03	Methods of preservation of microbial cultures (periodic transfer)		Chalk and board/PPT	
				Methods of preservation of microbial cultures (lyophilization, use of mineral oil and liquid nitrogen)			
				culture collection centers (culture banks) and their importance.			
August 2026	17.08.2026	22.08.2026	03	Role of micro-organisms in production of fermented food and dairy products (bread, yoghurt and cheese)		Chalk and board/PPT	
				Role of micro-organisms in production of organic acids (citric acid and vinegar)			
				Role of micro-organisms in production of alcoholic beverages made from grapes and cashew fruit juice; antibiotics (penicillin and streptomycin)			
August 2026	24.08.2026	29.08.2026	03	ISA 02 (Test)			
				Role of micro-organisms in decomposition of plant residues, bioremediation, production of biogas and biodegradable plastics. Micro-organisms as indicators of water pollution.			

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August 2026 - September 2026	31.08.2026	05.09.2026	03	Classification of plant diseases		Chalk and board/PPT	Dubey, RC and Maheshwari, DK (1999). A Text Book of Microbiology. S. Chand and Company Ltd., New Delhi.
				Disease symptoms caused by bacterial, fungal and viral pathogens.			
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September 2026	07.09.2026	12.09.2026	03	Stages of disease establishment – the disease cycle		Chalk and board/PPT	
				disease triangle;			
				Plant disease epidemics, monocyclic and polycyclic pathogens.			
September 2026	14.09.2026	19.09.2026	00	Ganesh Chaturthi Break			
September 2026	21.09.2026	26.09.2026	03	Transmission of disease		Chalk and board/PPT	Mehrotra, RS (1995). Plant Pathology. Tata McGraw-Hill Publishing Company Limited, New Delhi.
				Structural and biochemical defense mechanisms in plants (pre-existing and induced).			
				Structural and biochemical defense mechanisms in plants (pre-existing and induced).			
September 2026-October 2026	28.09.2026	03.10.2026	03	Physical, cultural, biological and IPM systems of plant disease management		Chalk and board/PPT	
				ISA 03			
				Physical, cultural, biological and IPM systems of plant disease management			
October 2026	05.10.2026	10.10.2026	03	Biopesticides		Chalk and board/PPT	
				Development of transgenics for disease management			

				Molecular diagnosis - identification of genes and specific molecules in disease development (DNA and protein based diagnostic kits).			
October 2026	12.10.2026	14.10.2026	02	Computer simulation of epidemics and disease forecasting; use of remote sensing and image analysis in plant pathology.		Chalk and board/PPT	
				Revision			

Assessment Rubrics

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