

ODD SEMESTER LECTURE PLAN (AY 2026-2027)							
Name of the college: Government College of Arts, Science and Commerce, Sanquelim Goa							
Name of Faculty: Dr. Nisha Kevat				Subject: Plant Physiology (THEORY)			
Paper code: BOT 201				Program/Course: S.Y B.Sc.		Division: - --	
Academic year: 2026 - 2027				Semester: III		Total Lectures: 45 (Theory)	
Course Objectives: 1. Develop an understanding of the physiological processes occurring in plants and their responses. 2. Enable the analysis of plant responses to various factors and understand their effects on physiological processes. 3. Impart practical skills essential for planning and executing research in plant physiology and allied fields							
Course Learning Outcome: 1. Enlist the role of mineral nutrients, plant pigments and phytohormones in plant growth. 2. Understand and describe various physiological processes such as absorption, transpiration, photosynthesis, photorespiration, translocation and nitrogen metabolism involved in plant growth. 3. Apply the knowledge of mineral nutrients and phytohormones in regulating plant growth. 4. Analyze plant responses to various growth and environmental factors and plan the experimental layout for research work.							
Month	Lectures From: To:		No. of lectures allotted	Topic, Subtopic to be covered	Exercise/Assignments	ICT Tools	Reference books
June 2026	22/06/	27/06	03	Lecture 1: Introduction to Syllabus	List the types of solutes transported in plants	Power Point Presentation, Chalk And Board, You Tube Study Videos	1. Bajracharya, D (1999). Experiments in Plant Physiology
				Lecture 2- Module 1: Transport of water, inorganic and organic solutes	Define water potential in one sentence.		
				Lecture 3: Plant water relations: Water potential and its components;			
June/ July 2026	29/06/	04/07	03	Lecture 4: water transport through xylem (ascent of sap);	dentify the main tissue involved in the ascent of sap.	Power Point Presentation, Chalk And Board, You Tube Study Videos	- A Laboratory
				Lecture 5: transpiration and its significance; factors affecting transpiration;	Name one factor that affects transpiration.		

				Lecture 6: root pressure and guttation.	Describe root pressure in one sentence.		Manual. Narosa	
July 2026	06/07/	11/07	03	Lecture, 7: Mineral nutrition: Criteria for determining essentiality of elements;	List two criteria for determining the essentiality of an element.	Power Point Presentation, Chalk And Board, You Tube Study Videos	Publishing House, New Delhi.	
				Lecture 8: macronutrients and micronutrients;	Differentiate between macronutrients and micronutrients.	Power Point Presentation, Chalk And Board, You Tube Study Videos	2. Evert, RF (2012). Raven Biology of	
				Lecture 9: role and deficiency symptoms of essential elements;	Name one deficiency symptom of nitrogen in plants.			Plants. International
July 2026	13/07/	18/07	03	Lecture 10: carriers and pumps.	Identify one type of pump involved in solute transport.	Power Point Presentation, Chalk And Board, You Tube Study Videos	Edition. 8th edition. Palgrave Macmillan,	
				Lecture 11: Translocation of organic solutes; composition of phloem sap;	Mention one component of phloem sap.			U.K.
				Lecture 12: path of translocation (girdling experiment)	Explain the girdling experiment.			3. Hopkins, WG and Huner, NP
July 2026	21/07/	26/08	03	Lecture 13: mechanism of translocation of organic solutes (Pressure Flow Model);	Describe the Pressure Flow Model in one sentence.	Power Point Presentation, Chalk And Board, You Tube Study Videos	(2009). Introduction to Plant Physiology.	
				Lecture 14: assimilate partitioning.	Explain assimilate partitioning in one sentence.			4th edition. John Wiley & Sons,
				Lecture 15: Module 2: Plant metabolism, Photosynthesis: Structure of photosynthetic apparatus;	Name the process of biological nitrogen fixation.			
July, 2026	20/07/	25/08	03	Lecture 16: photosynthetic pigments (chlorophyll a, chlorophyll b, carotenoids, phaeophytins and phycobillins).	List and briefly describe the major photosynthetic pigments found in plants.	Power Point Presentation, Chalk And Board, You Tube Study Videos		
				Lecture 17: Light reaction: Photosystems and harvesting of light;	Draw and label the structure of a photosystem and explain its role in light harvesting.	Power Point Presentation, Chalk And Board, You Tube Study Videos		
				Lecture 18: electron transport pathways (cyclic and non-cyclic);	Differentiate between cyclic and non-cyclic electron transport pathways in one sentence.	Power Point Presentation, Chalk And Board, You Tube Study Videos		
July/ August, 2026	27/07/	01/08	03	Lecture 19: mechanism of ATP synthesis (photophosphorylation).	Write a short note on photophosphorylation and how it leads to	Power Point Presentation,		

				Lecture 20: mechanism of ATP synthesis (photophosphorylation).	ATP formation.	Chalk And Board, You Tube Study Videos	U.S.A. 4. Jain, VK (2022).
				Lecture 21: Dark reaction: C3,	Describe the Calvin cycle (C3 cycle) in brief with any two key enzymes involved.		
August, 2026	03/08/	08/08	03	Lecture 22: C4	Explain how C4 plants minimize photorespiration using Kranz anatomy.	Power Point Presentation, Chalk And Board, You Tube Study Videos	Fundamentals of Plant Physiology. S.
				Lecture 23: CAM pathways of carbon fixation.	What adaptations help CAM plants survive in arid conditions? Give examples.		
				Lecture 24: Mechanism of photorespiration.	Define photorespiration and state one reason why it is considered wasteful.		
August 2026	11/08/	16/08	03	Lecture 25: Respiration: Glycolysis, TCA cycle, oxidative phosphorylation, Pentose Phosphate Pathway; anaerobic respiration.	Outline the stages of cellular respiration with at least one product of each.	Power Point Presentation, Chalk And Board, You Tube Study Videos	Chand and Company, Delhi.
				Lecture 26: Respiration: Glycolysis,	Write the steps of glycolysis and mention its net ATP gain.		
				Lecture 27: TCA cycle,	Illustrate the TCA cycle and mark any two key enzymes involved.		
August 2026	10/08/	14/08	03	Lecture 28: oxidative phosphorylation,.	Explain the role of the electron transport chain in oxidative phosphorylation.	Power Point Presentation, Chalk And Board, You Tube Study Videos	5. Kochar, SL and Gujral, SK (2020). Plant Physiology: Theory and Applications.
				Lecture 29: Pentose Phosphate Pathway;	What is the significance of the Pentose Phosphate Pathway in plants?	Power Point Presentation, Chalk And Board, You Tube Study Videos	
				Lecture 30: anaerobic respiration	Compare aerobic and anaerobic respiration in terms of energy yield.	Power Point Presentation, Chalk And Board, You Tube Study Videos	
August 2026	17/08/	22/08	03	Lecture 31: Module 3: Nitrogen metabolism, phytohormones and plant responses Nitrogen metabolism: Biological nitrogen fixation - I	Define biological nitrogen fixation and name two organisms that perform it.	Power Point Presentation, Chalk And Board, You Tube Study Videos	Cambridge University Press India Private Limited, New Delhi.
				Lecture 32: Module 3: Nitrogen metabolism, phytohormones and plant responses Nitrogen metabolism: Biological nitrogen fixation II	Write any two enzymes involved in biological nitrogen fixation and their role.	Power Point Presentation, Chalk And Board, You Tube Study Videos	

				Lecture 33: Assimilation of nitrate and ammonia - I	Explain how nitrate is reduced to ammonia in plants.	Power Point Presentation, Chalk And Board, You Tube Study Videos	6. Pandey, SN and Sinha, BK (2006). Plant Physiology. Vikas Publication House, New Delhi.
August, 2026	24/08/	29/08	03	Lecture 34: Assimilation of nitrate and ammonia - II	Describe the steps involved in the assimilation of ammonia into amino acids.	Power Point Presentation, Chalk And Board, You Tube Study Videos	
				Lecture 34: Phytohormones: Discovery and physiological roles of auxins,	State how ammonia is assimilated in plants.		
				Lecture 35: physiological roles of auxins,	Identify one physiological role of auxins.		
August/ September 2026	31/08/	05/09	03	Lecture 36: Discovery and physiological roles of gibberellins,	List one physiological role of gibberellins.	Power Point Presentation, Chalk And Board, You Tube Study Videos	7. Sinha, R (2015). Modern Plant Physiology. Narosa Publishing House, New Delhi.
				Lecture 37: Discovery and physiological roles of cytokinins,	Describe one function of cytokinins.		
				Lecture 38: Discovery and physiological roles of abscisic acid.	Describe one function of abscisic acid..		
September 2026	07/09/	12/09	03	Lecture 39: Discovery and physiological roles of ethylene.	Describe one function of ethylene.	Power Point Presentation, Chalk And Board, You Tube Study Videos	
				Lecture 40: Plant responses to light, temperature and stress	Identify one plant response to light.		
				Lecture 41 : Discovery and role of phytochrome and cryptochrome;	Define phytochrome in one sentence.		
CHATURTHI HOLIDAYS							8. Taiz, L, Zeiger, E, Moller, IM and Murphy, A (2015). Plant Physiology and Development.
September , 2026	21/09/	26/09/	03	Lecture 42: Responses of red and far-red light on photomorphogenesis;	Mention the effect of red light on photomorphogenesis.	Power Point Presentation, Chalk And Board, You Tube Study Videos	
				Lecture 43: technique, mechanism and applications of vernalization	Describe vernalization in one sentence.		
				Lecture 44: Plant responses to stress (drought)	List one plant response to drought stress.		
September /October, 2026	28/09/	3/10	03	Lecture 45: Plant responses to stress (salt).	State one plant response to salt stress.	Power Point Presentation, Chalk And Board, You Tube Study Videos	
				Lecture 46: Plant responses to stress (metals and radiations).	State one plant response to salt stress.		

				Lecture 47: REVISION	REVISION	Power Point Presentation, Chalk And Board, You Tube Study Videos	6th edition. Sinauer Associates, Inc.,
October , 2026	5/10/	10/10	03	Lecture 48: REVISION	REVISION	Power Point Presentation, Chalk And Board, You Tube Study Videos	U.S.A.
				Lecture 49: REVISION	REVISION		
				Lecture 50: REVISION	REVISION		
October , 2026	12/10	14/10	02	Lecture 51: REVISION	REVISION		
				Lecture 52: REVISION	REVISION		

*Note: Data filled in the above form is sample data.

*** Assessment Rubrics**

Component	Max Marks
ISA 1	7.5
ISA 2	7.5
ISA 3 (Best 2 of 3)	7.5
Practical	NA
Project	NA
Semester End Exam	80