

**-Name of the course: BOT.III.C-5: PHYSIOLOGY OF PLANTS THEORY: 45 MARKS**

**Name of the Instructor:** Dr. S.G. Sankhalkar, Associate Prof. Botany Department

**Department Ext:** 2154 **Email:** [Sgs001@chowgules.ac.in](mailto:Sgs001@chowgules.ac.in)

**Lecture Days: Monday (11.30-12.30), Wednesday & Thursday (10.30-11.30 hrs )**

**Practicals (Plant Physiology, Paper V) Friday (9.00- 11.00 am)**

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**Reference books:**

1. Devlin & Witham. Plant Physiology, 4<sup>th</sup> edition. CBS Publishers & distributors, New Delhi.
2. Taiz, L. and Zeiger, E. 1998. Plant physiology, (1<sup>st</sup> edition). Sinauer Associates, Inc., Publishers, Massachusetts USA.
3. Hopkins, W.G. 1995. Introduction to Plant Physiology. John Wiley & Sons, Inc., New York, USA.
4. S.K. Verma and Mohit Verma. A Text book of Plant Physiology, Biochemistry and Biotechnology, S. Chand and company Ltd., Ramnagar New Delhi.
5. P.S. Gill, 2000. Plant physiology. S Chand and Company Ltd, Ramnagar New Delhi
6. David W Lawlor. Photosynthesis 3<sup>rd</sup> edition, Viva Books private limited.
7. V.K.Jain. Fundamentals of Plant Physiology, 5<sup>th</sup> edition. S. Chand & company Publication, New Delhi.
8. Moore, T.C. 1989. Biochemistry and Physiology of Plant Hormones (2<sup>nd</sup> edition). Springer-Verlag, New York, USA

**Note:** No 2 & 3 for online reading AND ARE the BEST BOOKS FOR THE COURSE

## ACADEMIC PLANNER 2019– 2020

### S.Y. BSC, BOTANY SEM III- C-5

Sr. no	Day	Date	Lect. Room	Topic	Reference list
1	Wednesday	19/6/19	B-308	<b>UNIT 1: Plant water relation</b> <ul style="list-style-type: none"> <li>➤ Introduction to the syllabus</li> <li>➤ Important instructions with regards to teaching learning process</li> </ul>	<b>Ref. book 1</b>  1. pp. 34-45 1 pp. 34-45, 1. pp 73-80 1. pp, 80-88 3 .pp 91-92 4 .pp, 85-102 5. pp 123-127
2	Thursday	20/6/19	B-308	<ul style="list-style-type: none"> <li>➤ water &amp; its significance to the plant and the cell</li> </ul>	
3	Monday	24/6/19	B204	<ul style="list-style-type: none"> <li>➤ Osmotic water potential of cell</li> </ul>	
4	Wednesday	26/6/19	B-308	<ul style="list-style-type: none"> <li>➤ Water Potential</li> </ul>	
5	Thursday	27/6/19	B-308	<ul style="list-style-type: none"> <li>➤ Transpiration,</li> </ul>	
6	Monday	1/7/19	B-204	<ul style="list-style-type: none"> <li>➤ Anti-transpirants</li> </ul>	
7	Wednesday	3/7/19	B-308	<ul style="list-style-type: none"> <li>➤ Stomatal regulation</li> </ul>	
8	Thursday	4/7/19	B-308	<ul style="list-style-type: none"> <li>➤ Solving diffuculties</li> </ul>	

<b>UNIT-II: SOLUTE TRANSPORT</b>					
9	Monday	8/7/19	B-204	➤ Uptake & transport of water	Ref Book 1
10	wednesday	10/7/19	B308	➤ Essentiality of mineral nutrition & its uptake	
11	Thursday	11/7/19	B308	➤ translocation of water & organic solutes through xylem and phloem	1. pp 57-65 2. pp 85-92 -do- 1. pp 66- 71  8. pp 305-307,308-310 5. pp 307
12	Monday	15/7/19	B204	Phloem cell anatomy	
13	Wednesday	17/7/19	B-308	➤ Buffer lecture	
14	Thursday	18/7/19	B-308	➤ Transport of organic solutes	
15	Monday	22/7/19	B-204	➤ CA I Written test	
16	Wednesday	24/7/19	B-308	➤ Source sink relationship	
17	Thursday	25/7/19	B-308	➤ Active, passive and its role on membranes	
18	Monday	29/7/19	B-204	➤ Photo-assimilate partitioning	
<b>UNIT III: PHOTOSYNTHESIS</b>					
19	Wednesday	31/7/19	B-308	➤ Chloroplast and Light absorption	1.Pp 244-248 7. Pp 113- 114
20	Thursday	1/8/19	B-308	➤ Light harvesting complexes	1. pp, 248- 251 2. pp 166-167
21	Monday	5/8/19	B-204	➤ Z scheme of photosynthesis	3.pp,115-117

22	wednesday	7/8/19	B-308	➤ Group work	2.pp,183
23	Thursday	8/8/19	B-308	➤ Mechanisms of electron transport	6.pp 102- 103 3.pp 120- 121
24	Monday	12/8/19	B-204	➤ Photoprotective mechanisms ➤ Photophosphorylation	6. pp,79-112 6. pp,117-129 2. pp 142- 144
25	wednesday	14/8/19	B-308	➤ CO <sub>2</sub> fixation & RUBISCO	2. pp 196-199,201 2. pp, 208- 209,215
26	Thursday	15/8/19		➤ Independence day	
27	Monday	19/8/19	B-204	➤ C3, C4 and CAM pathways	
28	Wednesday	21/8/19	B-308	➤ Buffer lectures (Discussion)	
29	Thursday	22/8/19	B-308	➤ CA -2 ( Poster Presentation)	
30	Monday	26/8/19	B-204	➤ Environmental change and its impact on photosynthesis	
<b>UNIT IV: PLANT GROWTH AND DEVELOPMENT</b>					
31	Wednesday	28/8/19	B-308	➤ Role of phytochromes & Cryptochromes (functions)	2. pp 55-62 4. Pp 91-92 5.pp, 85-102 6. pp 123-127
32	Thursday	29/8/19	B-308	➤ Photoperiodism	2. pp, 66-69 6 pp, 996
➤ Ganesh Break					5 .pp, 96
33	Monday	9/9/19		➤ Vernalization	
34	Wednesday	11/9/19	B-308	➤ Senescence, seed dormancy & germination	4. pp 300-302

35	Thursday	12/9/19	B308	➤ Group work	1. Pp, 348-370
36	Monday	16/9/19	B-204	➤ <b>Plant hormones</b> (Types of growth regulators (Auxin, cytokinin, GA, ABA & ethylene)	1. pp 81-82 3 .pp 339-350 5.pp, 126-128 5 pp 307
37	Wednesday	18/9/19	B-308	➤ Mechanism of Transport	3. Pp, 355- 359
38	Thursday	19/9/19	B-308	➤ Physiological effects & functions	
39	Monday	23/9/19	B-204	➤ Buffer lecture (Tutorial)	
				<b>UNIT V: SECONDARY METABOLITES AND STRESS PHYSIOLOGY</b>	1. Pp, 223-234 4 pp 142- 144 1 pp 196-199,201
40	Wednesday	25/9/19	B-308	➤ Responses of plants to abiotic (water, temperature and salt) stresses	
41	Thursday	26/9/19	B-308	➤ <b>CA 3 Assignment</b>	
42	Monday	1/10/19	B 204	➤ Biosynthetic pathway of terpenes, phenols and alkaloids	
43	Wednesday	3/10/19	B308	➤ Phenolics, Alkaloids and their functions.	
44	Thursday	<b>4/10/19 Difficulties &amp; feedback</b>			
45		<b>SEMESTER END EXAMINATION</b>			

## REFERENCES

1. William G. Hopkins (1999). Introduction to Plant Physiology, 2<sup>nd</sup> edition, John Wiley A Sons, Inc.
2. Taiz, L. and Zeiger, E. (2006). Plant Physiology, 4<sup>th</sup> edition, Sinauer Associates Inc .MA, USA
3. Frank B. Salisbury and Cleon W. Ross (2002). Plant Physiology 3rd edition. CBS publishers and distributors.
4. G. Ray Noggle and George J.Fritz ( ) Introductory Plant Physiology Prentice Hall.
5. Goodwin Y.W., and Mercer E.I. (2003) Introduction to Plant Biochemistry. 2<sup>nd</sup> edition CBS Publishers and distributors.
6. Galstone A.W. (1989). Life processes in Plants. Scientific American Library, Springer Verlag, New York,
7. Moore T.C. (1989). Biochemistry and Physiology of Plant Hormones Springer –Verlag, New York,USA.
8. Singhal G.S.,Renger G., Sopory, S.K. Irrgang K.D and Govindjee (1999). Concept in Photobiology; Photosynthesis and Photomorphogenesis. Narosa Publishing House, New Delhi
9. Hopkins, W.G. and Huner, P.A. (2008) Introduction to Plant Physiology. John Wiley and Sons.
10. Salisbury, F.B. and Ross, C.W. (1991) Plant Physiology, Wadsworth Publishing Co. Ltd.
11. David I. Nelson and Michael M. Cox (2000). Lehninger. Principles of biochemistry, 3<sup>rd</sup>edition, Macmillan U.K.
12. David T Plummer (1985) An introduction to Practical Biochemistry 2<sup>nd</sup> edition. Tata Mcgraw Hill Publishing company Ltd.
13. D. Bajracharya (1999)Experiments in Plant Physiology.Narosa Publishing House new Delhi.

### **CURRENT LITERATURE (JOURNAL ARTICLES):**

Plant Physiology, The Plant Cell, Journal of Plant Physiology, Physiologia Plantarum, Plant Physiology and Biochemistry, Postharvest Biology and Technology, Journal of the American Society for Horticultural Science, Science, Nature, Scientific American.

### **Assignment Topics: (will be in groups)**

1. Phytochemicals and their significance ( andrea, aaialya,meruim, vanita,)
2. Water scarcity and physiological adaptations in plants (apporva, francis, lakshada, berdina)
3. Phytohormones : Boon or curse to agriculture (Amren,isha, harshada, divya)
4. Environment change and Influence on Agriculture ( Mitsy, mueen, Dikshita, hazel)
5. Plant Alkaloids ( Sachi, manisha, vanissa, Mafreen)
6. Nodulation and its influence on plants productivity(Krishnakant, nachiket, crystopher, Ukta)
7. Plant Senescence a natural phenomenon ( Daksh, shawn, Elton, allocia)

**COURSE TITLE: PHYSIOLOGY OF PLANTS (PRACTICALS)**

COURSE CODE: BOT.III.C-5

MARKS: 25

CREDITS: 1

PRACTICAL SESSION: 15

- 1 Determination of osmotic potential of plant cell sap by plasmolytic method.
- 2 Determine water potential of given tissue by falling drop method
- 3 .Chromatographic separation of plant pigments and plant sugars
- 4 Quantitation of total free amino acids

**5 Mini Project:**

1. Mineral deficiency symptoms in plants
2. Secondary metabolites in plants.
3. Oxygen consumption during respiration
4. Role of Plant hormones in plant growth
5. Light intensity and starch production







## **COURSE ASSESSMENT SCHEME**

For the academic year 2019-2020

Instructions:-

- Students must be informed about the Course scheme of Assessment and the same need to be uploaded in CLAAP/Google classroom.
- Refer to the Autonomy Ordinance AO-4.1 (Applicable for candidates who registered from the academic year 2014-15 onwards) and accordingly fill the details.

1. Course coordinator/ Faculty name: Dr. Sangeeta Sankhalkar

2. Name of the Department: Botany

3. Course title: Physiology of Plants

4. ASSESSMENT

Name of the Programme:

Credits: 04

**Mode of Assessment:** Only CA  CA & SEE  CA + midterm exam +SEE

### **SCHEME OF ASSESSMENT- THEORY**

ASSESSMENT TYPE	SCHEDULE OF ASSESSMENT	ACTIVITY (Mode of Assessment)	MARKS	RUBRICS	TOPIC	
<b>Continuous Assessments</b>	Test 1	July 22,2019	Test	30	3x10= 30M	Module 1 & 2
	Test 2	August 25,2019	Poster Presentation	30	15M- Gp presentation 10 M Individual viva 5M – Individual summary writup	Module 2, 4 & 5
	Test 3	Sept 27, 2019	Assignment	30	20 M – writeup (5M each for reference & plagerism check) 10 M – Viva	All Module

<b>Semester End Examination</b>	October	SEE	45			All topics
<b>Total Marks</b>			<b>135</b>	-----	-----	
			Average of all CA 30+ 45=75			

### **SCHEME OF ASSESSMENT - PRACTICAL**

**Is the LABORATORY manual uploaded? (specify YES/NO): \_\_\_\_\_ Total Marks: 25**

PRACTICAL ASSESSMENTS (CA1/CA2/...)	WEIGHTAGE /Marks	SCHEDULE OF ASSESSMENTS (Batch wise)
CA 1	25	July last week
CA 2	25	August
CA 3	25	Sept, last week (based on mini projects)

- **Is this scheme of Assessment is discussed in the Department Faculty Council (DFC)?(Specify yes/no):**
- **Date of uploading in CLAAP/Google classroom: Regularly uploading**

**Date:**

**Signature of the Course Coordinator**

**Signature of the HOD**