

NUTRITION AND PLANT BIOCHEMISTRY

Sem	Subject Code	Category	Lecture		Theory		Practical		Credit
			Hrs/ week	Hrs/ sem.	Hrs/ week	Hrs/ sem.	Hrs/ week	Hrs/ sem.	
VI	21CBC6A	Core	5	75	5	75	-	-	5

COURSE OBJECTIVE:

- To discuss the established functions of micronutrients and to examine the clinical and biochemical effects of depletion.
- To understand plant cell structure, organization, and the role of different biosynthetic pathways in plant growth and development.
- Understanding of Plant defence mechanism against pathogens.

COURSE OUTCOMES:

On the successful completion of the course, students will be able to -

CO Number	CO Statement	Knowledge Level (K ₁ – K ₄)
CO1	Gain the basic knowledge about Nutrition, BMR and energy expenditure.	K1
CO2	Obtain the knowledge about vitamins and their functions.	K2
CO3	Obtain the knowledge about minerals and their functions.	K2
CO4	Acquire basic knowledge about plant physiology and plant hormones.	K3
CO5	Gain the knowledge about role of plant in its defence mechanism and to understand the process of production of biotechnological products.	K4

(*CO – Course Outcomes)

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

MAPPING WITH PROGRAMME OUTCOMES:

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M	S	S	M	M	M
CO2	S	S	M	S	S	M
CO3	S	M	M	S	M	S
CO4	M	M	S	S	S	S
CO5	S	S	S	M	M	S

(S- Strong; M-Medium; L-Low)

Total Hours: 75

UNIT I

Energy Measurement

15 Hours

Definition for nutrition, Nutrients, Body weight, Body composition. Respiratory Quotient and Specific Dynamic action. Measurement of energy expenditure - Basal Metabolic Rate- Measurement, factors affecting BMR and its significance.

UNIT II

Vitamins

15 Hours

Definition, classification. Structure, function, dietary sources, nutritional requirements deficiency states of fat soluble vitamins (A, D, E, K) and water soluble vitamins (B complex vitamins and C).

UNIT III

Minerals

15 Hours

Definition and classification of Minerals. Nutritional requirements, dietary sources, function and deficiency states of minerals [Ca, P, K, Na, Zn, Fe, I, Mg, Mn]. Nutritious diet sheet- childhood, adolescence and adults, Pregnancy and lactation.

UNIT IV

Plant Physiology and Plant Hormones.

15 Hours

Structure and functions of Plant cell. Mechanism of water absorption – Aquaporins, Symplast and Apoplast concept. Transpiration and role of stomata. Photosynthesis and its regulation. Photorespiration. Plant hormones - Auxin, Gibberellins, Cytokinins, Abscissic acid, Ethylene.

UNIT V

Plant defence mechanism and Microbial production.

15 Hours

Defence mechanism in plants against pathogens – Structural and Biochemical defence. Production of biotechnological products – SCP (Algae, Yeast, Mushroom). Biofertilizers, Biopesticides.

DISTRIBUTION OF MARKS: Theory - 100% and Problems – Nil

TEACHING METHODOLOGY:

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

TEXT BOOKS:

S.NO.	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	U.Satyanarayana, U.Chakrapani	Biochemistry	Books and Allied (P) Ltd	2010
2	<u>B. Srilakshmi</u>	Nutrition Science	New Age International Pvt Ltd	2009
3	R C Dubey	A Text Book of biotechnology	S Chand	4 th Edition 2006

REFERENCE BOOKS:

S.NO	AUTHOR	TITLE	PUBLISHER	YEAR OF PUBLICATION
1	Christopher K. Mathews and K. E. Van Holde	Biochemistry	Benjamin/Cummings	2 nd edition 1996
2	NayakShivananda B,	Handbook of Biochemistry and Nutrition	Jay pee brothers Medical publishers	3 rd edition 2014
3	<u>Phyllis A. Balch</u>	Prescription for Nutritional Healing, Fifth Edition	Avery	Revised edition 2010

4	Brian J. Deverall	Defence mechanism of plants	Cambridge University Press	1977
5	William G. Hopkins and Norman P. A. Huner	Introduction to Plant Physiology	John Wiley & Sons	4 th Edition 2008
6	Alan Crozier	Plant Secondary Metabolites	Blackwell Publishing Ltd	2006
7	Kirti Rani	Microbial Production Technology	Lap Lambert Academic Publishing	2012
8	Richard H. Baltz	Manual of Industrial Microbiology and Biotechnology	American Society for Microbiology	3 rd Edition 2010

WEB SOURCES

- www.healthline.com/health/what-is-basal-metabolic-rate
- www.healthline.com/nutrition/fat-soluble-vitamins
- www.healthline.com/nutrition/water-soluble-vitamins
- www.sciencedirect.com/journal/plant-physiology-and-biochemistry
- <https://courses.lumenlearning.com/boundless-biology/chapter/plant-defense-mechanisms/>
- <https://byjus.com/biology/single-cell-protein/>

SYLLABUS DESIGNER:

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