PLANT AND ANIMAL PHYSIOLOGY

Semester	Subject Code	Category	Lecture		Theory		P	C
II	21CPBT2D	Elective - II	3 hrs per week	45	3 hrs per week	45	0	3

COURSE OBJECTIVE:

- After completing the course the students should be able to understand the Structure and function of animal physiology and organ systems are considered in the following context; circulation, respiration, nervous systems, endocrine systems, excretion and developmental biology. Concerning plants there is special emphasis on plant physiology.

COURSE OUTCOMES:

Upon successful completion of the course the students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL (K2-K5)
CO1	Understand the process of photosynthesis, respiration and transpiration.	K2
CO2	Demonstrate the synthesis of plant hormones and secondary metabolites.	K3
CO3	Analyze Cardiac cycle and the electrocardiogram (ECG).	K4
CO4	Differentiate animal reproduction in different species respectively.	K4
CO5	Compare renal physiology and endocrinology and its regulations.	K5

Knowledge level: K1- Remember; K2- Understand; K3- Apply; K4- Analyze; K5- Synthesize; K6- Evaluate

MAPPING WITH PROGRAM OUTCOMES:

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

S-strong; M- medium; L-low

UNIT I

General and applied plant physiology **10 Hours**

Photosynthesis- Light harvesting complexes: Mechanisms of electron transport, photo protective mechanisms; Co2 fixation- C3 pathway, C4 pathway and CAM Pathways. Respiration: Citric acid cycle: Plant mitochondrial electron transport and ATP synthesis; alternate oxidase: Photo respiratory pathway. Transpiration: Cuticular transpiration, lenticular transpiration, Stomatal transpiration. Mechanism of Stomatal opening and closing-Activation of photo pumping, Synthesis of organic solutes, Factors influencing Transpiration, Internal factors-Transpiration Ratio.

UNIT II

Plant hormones and Nitrogen metabolism **9 Hours**

Plant hormones- Biosynthesis of plant hormones-types of plant hormones -Auxin (Tryptophan –dependent pathways, Tryptophan –Independent and physiological effects), storage, breakdown and transport, physiological effects& mechanism of actions. Nitrogen Metabolism: Nitrogen cycle- Denitrification, Anammox, Biological nitrogen fixation, Nitrate assimilation, ammonium assimilation: amino acid biosynthesis. Secondary metabolites- Sources of secondary metabolites, biosynthesis of terpenes, phenols and nitrogenous compounds and their roles.

UNIT III

Cellular physiology and Homeostasis **10 Hours**

Blood corpuscles, haemopoiesis and formed elements, plasma function, blood volume, blood volume regulation, blood groups, haemoglobin, immunity, haemostasis. Cardiovascular System - Comparative anatomy of heart structure, myogenic heart, specialized tissue, ECG – its principle and significance, cardiac cycle, heart as a pump, blood pressure, neural and chemical regulation of all above.

UNIT IV

Animal Reproduction **8 Hours**

Reproduction: Introduction, Types of reproduction –Asexual reproduction, S exual reproduction: endogamy, exogamy, isogamy, ansogamy, conjugation and human reproductive system-accessory glands , male sexual response and hormonal control, spermatogenesis. Female reproductive system, ovaries structure, oogenesis, ovarian follicle development, female sexual response & hormone control.

UNIT V

Renal physiology & Endocrinology **8 Hours**

Excretory system - Comparative physiology of excretion, kidney, urine formation, urine concentration, waste elimination, micturition, regulation of water balance, blood volume, blood pressure, electrolyte balance, acid-base balance. Stress and adaptation Digestive system

- Digestion, absorption, energy balance, BMR. Endocrinology and reproduction - Endocrine glands, basic mechanism of hormone action hormones and diseases; reproductive processes, gametogenesis, oogenesis, neuro endocrine regulation.

TEXT BOOKS:

S.NO.	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	S.C. Rastogi	Essentials of Animal Physiology	New age International Publisher	2019
2.	V. K. Jain	Fundamentals of Plant Physiology	Paperback publisher	2017
3.	P.B.Reddy's	Text Book of Animal Physiology	Ratna Prasad Multidisciplinary Research & Educational Society	• 2015

REFERENCE BOOKS:

S.NO.	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	H.R. Singh and Neeraj Kumar	Animal Physiology & Biochemistry	Paperback publisher	2017
2.	Hema Sane	Plant Physiology	Vision publication	2014
3.	SarojiniChakravarthy	Plant Physiology	SIA Publishers & Distributors	2019

WEB SOURCES

1. https://ssec.si.edu/stemvisions-blog/what-photosynthesis
2. www.phytohormones.info/
3. https://www.pondermed.com
4. www.animal-reproduction.org/
5. https://www.physiology.org/

Syllabus Designer:

- Dr. J. Ilamathi
  Assistant Professor