

MB1PG04- PHYSIOLOGY AND BIOSTATISTICS

Number of Hours / Week: 4

Credits: 4

UNIT- I

Plant Physiology 1:

Autotrophy, heterotrophy, intake of water and nutrients, transpirations, photosynthesis, mineral nutrition, respiration, photorespiration, Growth and Reproduction; enzymes, Hormones and growth regulators- auxins, gibberlins, kinins, ethylene and other compounds - physiological function and mechanism of action

UNIT II

Plant Physiology 2:

Mechanisms of action of phytochromes, cryptochromes & phototropins. Stress physiology, water stress and other stresses, Photoreceptors, Morphogenesis,, Totipotency - principles and differentiation, photomorphogenesis, phytochromes; physical and chemical properties, photoperiodism - general principles and response type.

UNIT-III

Human Physiology:

Blood and circulation: Blood corpuscles, haemopoiesis and formed elements, plasma function, blood volume, blood volume regulation, blood groups, haemoglobin, immunity, haemostasis. Elementary tissues- epithelial tissue, connective tissue, muscle tissue, nervous tissue, **Cardiovascular System:** cardiac cycle, heart as a pump, blood pressure, neural and chemical regulation of all above. **Respiratory system:** transport of gases, exchange of gases, waste elimination, neural and chemical regulation of respiration.

UNIT IV

Nervous system: brain and spinal cord, central and peripheral nervous system, neural control of muscle tone and posture. **Excretory system:**, regulation of water balance, blood volume, blood pressure, electrolyte balance, acid-base balance. **Thermoregulation:** Comfort zone, body temperature – physical, chemical, neural regulation, acclimatization. **Digestive system:** Digestion, absorption, energy balance, BMR.

UNIT V

Scope of Biostatistics, probability and probability distribution analysis. Variables in biology- collection, classification and tabulation of data- graphical and diagrammatic representation- scatter diagrams, histograms- frequency polygon- frequency curve-logarithmic curves. Descriptive statistics- measures of central tendency, Arithmetic mean, median, mode, geometric mean, harmonic mean. Measures of dispersion, standard deviation, standard error, variance, coefficient of variation. Correlation and Regression. Test of significance. Basic idea of

significance test- hypothesis testing, levels of significance, Chi-square test and goodness of fit, comparison of means of two samples, three or more samples. Statistical packages.

References:

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5. Widmaier, Raff, *Strang Vander's Human Physiology- The Mechanism of Body function*.
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7. John. B. West *Physiological basis of Medical Practice*.
8. William. F. Ganong *Review of Medical Physiology* (LANGE Basic Science).
9. K. Sembulingam & Prema Sembulingam *Essentials of Medical Physiology*.
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12. Moat, A.G., Foster, J.W. and Spector, M. P (2002). *Microbial Physiology*, John Wiley & Sons, New York. 4th ed.
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16. Rabert Poole, K. (2007) *Advances in Microbial Physiology*, Volume 53 Elsevier Science & Technology