**COURSE OUTCOMES**

**B.Sc – Botany IIIrd year**

**Semester- V**

**Subject: Plant Physiology (Theory & Practical)**

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| **CO 1** | Understand the importance and properties of of water to plant |
| **CO 2** | Study the absorption and transport of water in plants, role of stomata in transpiration |
| **CO 3**. | Expalin Mineral Nutrition including Essential macro and micro elements and their role mineral uptake and deficiency symptoms |
| **CO 4**. | Describe Transport of Organic Substances andMechanism of phloem transport define source-sink relationship and factorsaffecting translocation |
| **CO5** | Detailed study of Photosynthesis their Significance and historical aspects of photosynthetic pigments about action spectra and enhancement effects and concept of two photosystems& Z-scheme , photo-phosphorylation , Calvin cycle. |
| **CO6** | Explain Respiration includingATP–the biological energy currency&aerobic and anaerobic respiration , Krebs cycle , electrontransport mechanism (chemi-osmotic theory) ,redox -potential and oxidative phosphorylation& pentose phosphate pathway. |
| **CO 7** | Study Seed dormancy& plant movements explaining the concept of photoperiodism and physiology of flowering with florigen concept& physiology of senescence and fruit ripening |

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**Subject: Ecology (Theory & Practical)**

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| **CO1** | Study Introduction to Ecology explaining Definition, scope and importance; levels of organization |
| **CO2** | Describe Environment &Introduction , environmental factors- climatic (water, humidity wind ,light, temperature),edaphic (soil profile, physico-chemical properties), topographic and Adaptations of plants to water stress and salinity &morphological and anatomical features of hydrophytes, xerophytes and halophytes |
| **CO3** | Explain Population Ecology their Basic concept , characteristics , biotic potential, growth curves , ecotypes and ecads. |
| **CO4** | Explain Community Ecology: Concepts; characteristics (qualitative and quantitative-analytical and synthetic); methods of analysis; ecological succession. |
| **CO5** | Describe Ecosystem and their Structure their components and functions (trophic levels, food chains, food webs, ecological pyramids and energy flow) |
| **CO6**. | Acquaint Biogeochemical Cycles like carbon and nitrogen and hydrological (water) cycle. Explaining the Phyto-geography , Phyto-geographical regions of India |
| **CO7** | Understand Environmental Pollution and thier Sources, types and control of air and water pollution, Global Change: Greenhouse effect and greenhouse gases , impacts of global Warming , carbon trading |

**CREDITS**- 3 **THEORY PERIODS OF EACH PAPER OF 45 MINUTES EACH PER WEEK OVER A SEMESTER**

**6 PRACTICAL PERIODS OF 45 MINUTES EACH PER WEEK OVER A SEMESTER**

**B.Sc – Botany IIIrd year**

**Semester- VI**

**Subject: Biochemistry and Plant Biotechnology (Theory & Practical)**

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| **CO 1** | Describe the Basics of Enzymology& Discovery and nomenclature ,characteristics of enzymes; concept of holoenzyme, apoenzyme, coenzyme and co-factors and regulation of enzyme activity and their mechanism of action. |
| **CO2** | Explain Growth and development their Definitions, phases of growth and development. describe Plant hormones- auxins, gibberellins, cytokinins, abscissic acid and ethylene, history of their discovery, mechanism of action; photo-morphogenesis; phytochromes and their discovery, physiological role and mechanism of action. |
| **CO3** | Study Lipid metabolism their Structure and functions of lipids ,fatty acid biosynthesis, B-oxidation , saturated and unsaturated fatty acids, storage and mobilization of fatty acids . and Nitrogen metabolism: Biology of nitrogen fixation, importance of nitrate reductase and itsregulation; ammonium assimilation. |
| **CO4** | Examine Genetic engineering and Biotechnology their Tools and techniques of recombinant DNA technology; cloning vectors , genomic and cDNA library; transposable elements; aspects of plant tissue culture; cellular totipotency, differentiation and morphogenesis& biology of Agro-bacterium , vectors for gene delivery and marker genes. |

**Subject: Economic Botany (Theory & Practical)**

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| **CO1** | Illustrate Origin, distribution, botanical description, brief idea of cultivation and uses of the following:Food plants- Cereals , Pulses, Vegetables, Fibers, , Oils |
| **CO 2** | Study the Morphology of plant part used, brief idea of cultivation and uses of the following: Spices- Coriander, Ferula, Ginger, Turmeric, Cloves. Medicinal Plants- *Cinchona*, *Rauwolfia*, *Atropa*, *Opium*, *Cannabis*, Neem |
| **CO 3** | Understand Botanical description and processing of: Beverages- Tea and Coffee , Rubber- *Hevea ,* Sugar- Sugarcane |
| **CO4** | General description and sources of timber , energy plantations and bio-fuel |

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