Work Load
Department of Botany, B. N. College, Patna

Topics	Dr. Vinod Prasad	Mr. Dheeraj Goutam	Dr. Rajeev Kumar	Dr. Devanand Kumar
Part-II				
Plant Taxonomy (Paper-III)	-Nomenclature, Classification and phylogeny -Phenetics, Phyletics and Cladistics -Nomenclature, Nomenclatural Types	Comparative studies of classification systems of C. Linnaeus, G. Benthem & J. D. Hooker, Adolf Engler & Karl Prantl And J. Hutchinson	Rannunculaceae, Annonaceae, Magnoliaceae, Caryophyllaceae, Tiliaceae, Euphorbiaceae, Cucurbitaceae, Rubiaceae, Apocynaceae	Asclepiadaceae, Bonaginaceae, Scrophulariaceae, Acanthaceae, lamiaceae, Amaranthaceae, Orchidaceae, Commelinaceae, Cyperaceae and Poaceae
Plant Anatomy (Paper-III)	-Mechanical Tissues- Their structure, distribution and functions -Anomalous, origin and functions	Meristem structure and functions. Various theories regarding organization and special meristem.	Organization of tissue in relation to environment	Periderm-structure and functions.
Plant Embryology (Paper-III)	Fertilization Embroygency	Endosperm	Experimental Embryology	Microsporogenesis and male gametophyte Megasporogenesis and female gametophyte
Economic Botany (Paper-III)	Cereals, Pulses, Oil Seeds, Sugar, starch yielding plants and Medicinal Plants	Fruits, vegetable, Spices, condiments and Beverages.	Narcotics, gums, resins, rubber and Essential oil.	fibre yielding plants and timber yielding plants
Cell Biology (Paper-IV)	Techniques in cell Biology, Principles of light, Phase contrast, fluorescence and electron microscopy. Autoradiography and their	Structure and functions of cell organelles, Cell wall and cell membrane.	Conceptual theories, Cell Theory, Comparative accounts of pro and eukaryotic cells, Characteristics of	Ultra structure of chromosome, cell division and its regulation.

	applications. Staining techniques: acetocarmine and fuelgen.		archaebacteria and mycoplasma.	
Cytogenetics (Paper-IV)	Linkage and crossing over, Structure, replication and expression of DNA. Genetic code. Mutation: induction and biochemical basis. One gene one polypeptide hypothesis and Human genetics.	Physical and chemical basis of heredity, Mendelian Inheritance, Interaction of genes, Polyploidy and chromosomal aberration. Genetics of bacteria and that of viruses.	Extra-nuclear inheritance, Sex-linked inheritance, Mechanism of chromosomal and genetic sex-determination.	Cell cycle, Lampbrush chromosome, B-chromosome and Polytene chromosome, physical and chemical basis of heredity
Plant Breeding (Paper-IV)	Cytogenetics in crop improvement.	General principles of breeding for crop improvement.	Centres of origin of cultivated plants.	
Part-III				
Molecular Biology	DNA replication, mechanism of prokaryotic and eukaryotic DNA replication. mechanisms of DNA damage and repair (mismatch repair, nucleotide excision repair and base excision repair) Transcription and translation. Gene regulation (prokaryotic and eukaryotic)	Genetic engineering (Tools and techniques, enzymes and vectors) and its roles in human welfare, Plant biotechnology, Explants culture and protoplast culture) Applications of plant tissue culture.	Isolation and synthesis of foreign DNA, Organo-chemical synthesis of genes. Strategy for creation of recombinant DNA and its transfer in hosts.	PCR and DNA fingerprinting. Genome library, c- DNA library. Bioinformatics, an elementary study
Plant Biotechnology	Plant biotechnology	-----	-----	-----
Plant Physiology	Photosynthesis pigment system, Photophosphorylation, Calvin cycle, Hatch and Slack cycle, Respiration Glycolysis, Krebs cycle, Oxidative phosphorylation,	Physiology of flowerinf, Photoperiodism- roles of pigments and hormones. Mechanism of stomatal movement and its regulatory factors. Vernalization, Growth and Differentiation.	Biological nitrogen fixation and its mechanisms. Micro and macro nutrients and their roles in plant nutrition. Fat synthesis.	Imbibition, Diffusion, Osmosis, Osmotic pressure, Diffusion pressure, Diffusion pressure deficit, Active and passive transport of water and solutes.

	Phytohormones: Axons, Gibberellins and Cytokinines,	Plant movement.		Conduction of water. Phloem transport.
Biochemistry	Regulation of protein synthesis, Secondary plant metabolites and their roles. Carbohydrates.	Proteins, Enzymes: Classification, nomenclature, physiochemical properties.	Fat, Co factors and co enzymes.	Nucleic acids
Biodiversity & Environmental Biology	Ecological factors, isolation, precipitation and climate edaphic factors, Biotic factors. Environmental population and public health; Environmental pollutants, Air and water pollution, radioactive and noise pollution, pollution control measures. Major vegetational belts of India, An elementary study of Aerobiology, MBA programme, resource ecology conservation forestry, Wild life management and Aquaculture.	Ecological succession, seral and climax communities, succession in terrestrial and aquatic ecosystems. Ecological energetic: fixation of energy by autotrophs, Energy flow beyond producers and concept of productivity, food chain, food web, energy flow models, energy pyramids and biomass. Population ecology: population growth structure and population regulation.	An introduction to the concept of Biological diversity- causes and consequences of its loss and conservation, Concept of Environment, Ecology, Biosphere, Biome, Ecosystem, Habitate, Niche, Community and population. Concepts of Autoecology and Synecology and its methods of studies.	Structure and functions of ecosystems (land, fresh water and forest ecosystem), Biochemical cycles: hydrological cycles, water harvesting, Gaseous and sedimentary nutrient cycle. Community Ecology- structure, organisation, functions and methods of its studies.

Note: Topics are subject to change as per convenience of faculties.

Head