**Govt. C.L.C Arts and Science College Patan, Durg**

2023-24

DEPARTMENT OF BOTANY

**Methods of delivery**

* Use of ICT
* Chalk and talk method
* Problem solving
* Group discussion
* Test
* Notes

**CLASS: B.Sc.1St year PAPER I (Microbial Diversity and Plant Pathology)**

**Name of Teacher: Mr. Dorelal Madhukar**

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| Month | Title unit/ No. of lectures | Topic of lecture |
| July | unit 1/12 | **Microbial Technique and Instrument:** Light, scanning, Phase contract and transmission electron microscope**,** staining technique and instruments |
| August | Unit 1/ 5    Unit 2/ 7 | **Instrument:** autoclave, oven, laminar air flow, centrifuge, colorimeter, sphectrophotometer, electrophoresis, immobilization method, fermentation and fermenters.  **BACTERIA:** structure of prokaryotic and eukaryotic bacteria, fine structure of bacterial cell, Gram positive and Gram negative bacteria, bacterial growth curve and factor affecting growth of microbe, reproduction and recombination (Conjugation, transformation and transduction), |
| September | Unit 2/12 | **VIRUSES:** General characteristics, types of viruses based on structure and genetic material. Multiplication of viruses (General account), Lytic and Lysogenic cycle. Structure and multiplication of Bacteriophages and TMV. General account of Viroids, Virusoids, Prions, and mycoplasma,m phytoplasma, actinomycetes and their economic uses. |
| October | Unit 2 /8  Unit 3/4 | **Applied microbiology:** food fermentation and food produced by microbes , production of antibioticsenzymes , alcoholic beverages, lactic acid and acetic acid production. Antigen, antibody and production of monoclonal antibody  **Phycology**: General characters, classification, range of thallus organization, reproduction, life cycle patterns. |
| November | Unit 3/10  Unit 4/3 | Classification, Systematic position, occurrence, structure and life cycle of following genera:*, Volvox„ Oedogonium, Vaucheria, Chara, Ectocarpus, Polysiphonia.*  economic importance of algae: blue green algae for soilfertility and N2 economy of soil  **Mycology, Mushrrom cultivation, Lichenology Michorriza:** General account of habit and habitat, structure (range of thallus organization), cell wall composition, nutrition and reproduction in fungi. Heterothallism and Parasexuality. |
| December | Unit  4/12 | Outlines of classification of fungi. Economic importance of fungi. Life cycles of mastigomycotina *phytopthora and Albugo zygomycotina rhizopus and mucor ascomycotina Sachharomyces penicillium, Peziza, basidiomycotina Agaricus, Ustilago, Puccinia, Deutaromycotina Alternaria, fusarium and collatotrichum.* VAM Fungi Lichens- General account, types, structure, nutrition, reproduction and economic importance of lichen  Mycorriza: ectomicorrhiza,endomicorrizaand their significance.  Mushroom cultivation: Button and Oestor Mushroom |
| January | Unit  5/12 | **Plant pathology:** Disease concept symptoms etiology ,Primary and Secondry inoculam pathology , kotch’s postulates. Mechanism of infection and predispososing factor, Disease reocurrance defence mechanism: physical and biochemical, disease resistance, Systemic fungicides organomurcurial and sulphur containing fungicides |
| February | Unit  5/12 | **Diseases and control:** symptoms, causal organism desease cycle , control measure of - early and late blight of potato, damping of seedling, false smut of rice/ brown smut of rice, black rust of wheat, alternaria spot or white spot of crusifer , red rust of sugarcane, wiltinf of arhar, mosaic desease of tobacco and cucumber, yellow vein mosaic of bhindi citrus cancer, little leaf of brinjal disease management Qurantine organization intrigated plant disease management biological control. |

**CLASS: B.Sc.1St year PAPER II (Archigoneateae and Plant Architecture)**

**Name of Teacher: Pankaj Kumar Tiwari**

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| Month | Title unit/ No. of lectures | Topic of lecture |
| July | Unit 1/12 | **BRYOPHYTA:** General characteristics, affinities, range of thallus organization, general classification and economic & ecological importance, *Riccia, Marchantia, Anthoceros, .*. |
| August | Unit 1/ 5  Unit 2/7 | Systematic position, occurrence, morphology anatomy and reproductive structure in sphagnum Vegetative reproduction in Bryophytes, Evolution of sporophytes  **PTERIDOPHYTES:** General characteristics, affinities, economic importance and classification, Heterospory and seed habit, stellar system in Pteridophytes, Aposory and apogamy, Telome theory, |
| September | Unit 2/12 | Systematic position, occurrence. Morphology, anatomy and reproductive structure of *Psilotum, Lycopodium, selaginella, Equisetum, Marsilea.* Pteris. |
| October | unit 3 / 12 | Gymnosperm: General characteristics, affinities, economic importance and classification, Morphology, anatomy and reproduction in *Cycas,. Pinus.* |
| November | Unit 3/ 7  Unit 4/5 | affinities, economic importance and classification, Morphology, anatomy and reproduction in *Ephedra.*  PALAEOBOTANY: Geological time scale, types of fossils and fossilization fossil technique |
| December | Unit 4/ 12 | Fossil plant; Rhynia , Williamsonia, cycodiodales contribution of Prof. Birbal sahani |
| January | Unit 5 /12 | Angiosperm Morphology: Morphology and modification of root stem leaf and bud |
| February | Unit 5/ 12 | Type of inflorescence: flower , flower parts, fruit and type of placentation definition and tyupe of Seed |

**CLASS: B.Sc. II year PAPER- I (Plant taxonomy, Economic Botany, Plant anatomy)**

**Name of Teacher: Dr. Vandana Dhandhore**

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| Month | Title unit | Topic of lecture |
| July | unit 1 /10 | Bentham and hooker Systemof classification BiNomial Nomenculture, IUACN for algae fungi and plant |
| August | Unit 1 / 6  Unit 2/ 6 | Typification, Numerical taxonomy and chemotaxonomy herbarium  Botanical garden  Systemic position character important of families  Ranunculacdacde ,Mangoliacdeace, Rutaceacee, Poaceac, Apaiaceae, Rubiaceae, Ascleipediaceae |
| September | Unit 2/12 | Cucurbitaceae, Apocynaceae, Malvacece, Lamiaceae, Solanaceae, Asteracece, Fabaceae, Poaceace, Liliacecae |
| October | Unit3/12 | Economic botany :botanical name family part used and use of economic important plant , Fiber yielding ; cotton , jute, sun heim. Timber yielding sal teak sessam and pine  medicinal plants :-Kalmegh Ashwagandha gritkumari, giloy, Brahmi sarpgandha |
| November | Unit3/12 | Food plants pearl millet wheat Sorghum shoyabean, gram, Graund nut, sugar cane and potato.  Fruit yielding plants pear peach litchi. Spices cinnamon turmeric, Ginger Asafoitedaand cumin.  Beverages; Tea Coffee rubber production from chrysantheium Dahelia Biodiseal jatropha Pongamia. Ethnobotany context of chhattishgarh |
| December | Unit 4/ 12 | Plant anatomy: root and shoot apical meristem theories of root and shoot apex organization permanent tissue  Anatomy of root stem leaf of dicot monocot |
| January | Unit 4/ 12 | secondry growth inroot and stem anamolies in primary structure of (nectanthus boerhavia and cassurina)  Anamolous secondry growth in Dracenea Bignonia Laptadenia. |
| February | Unit 5/  12 | Embryology: Flower as reproductive organ Anther, Microsporogenesis, type of ovule, Megasporogenesis, development of male ad female gametophytes , pollination Mechanism, self Incompatibility, Fertilization, endosperm, Embryo, polyembryony, apomixesand parthenocarpy |

**CLASS: B.Sc. II year** **PAPER- II (Ecology and Plant Physiology)**

**Name of Teacher: Pankaj Kumar Tiwari**

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| Month | Title unit/ No. of lectures | Topic of lecture |
| July | Unit 1/10 | Introduction to ecology, Ecological fsctors, Soil formation and Soil profile, Leibig law of minimum |
| August | unit 1/ 6  unit2/6 | , Shelford law of tolerance, Morphological anatomical adaptation in hydrophytes, xerophytes and Epiphytes  Population and community characteristics Raunkiers life for, Population interaction (symbiosis , amanselism) |
| October | Unit 2/12 | sucession ecotone edge effect, ecological niche, ecotype ecade, keystone species  Concept of ecosystem trophic level , energy flow food chain and food web concept of ecological pyramid in ecosystem  Nitrogen cycle and phosphorous cycle |
| November | Unit 3/12 | Plant water realtion diffusion permeability, Osmosis imbibition, Plasmolysisosmotic potential and water potential, type of soil water , water holding capacity, Wilting Absorption of water theories of ascent of sa, mineral nutrition and absorption, deficiency Symptoms , Transpiration, stomatal transpiration |
| December | Unit 4/ 13 | Photosynthesis: photosynthetic apparatus and pigment, light reaction and dark reaction mechanism, C3, c4, CAM pathway of Carbon reduction |
| January | Unit 4/ 12 | , photorespiration factor affecting photosynthesis  Respiration aerobic and anaerobic respiration, Glycolysis, Kreb’s cycle. Factor affecting respiration R.Q. |
| February | Unit 5/ 10 | Plant growth harmones: Auxin Gibberelin, Cytokini Ethylene  Abscissic acid and physiology of Floweering, FLorigen concept, Photoperiodism, and Vernalization seed dormancy and seed germination, Plant movements |

**CLASS: B.Sc. III year PAPER- I (ANALYTICAL TECHNOLOGY PLANT PATHOLOGY, EXPERIMENTAL EMBRYOLOGY, ELEMENTARY BIOSTATISTICS, ENVIRONMENTAL POLLUTION AND CONSERVATION)**

**Name of Teacher: Praveen Jain**

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| Month | Title unit / No. of lectures | Topic of lecture |
| July | unit 1 /10 | Structure, Principle and applications of analytical instrumentation. Chromatography technique, Oven, Incubator, Autoclave, Centrifuge, Spectrophotometere |
| August | Unit 2/ 12 | Plant Tissue culture techniques, growth media, totipotency, protoplast culture, somatic hybrids and cybrids, |
| September | Unit 2/12 | micropropagation, somaclonal variations, haploid culture. Analytical techniques: Microscopy-Light microscope, Electron microscope |
| October | Unit3/12 | General principles of plant pathology, general symptoms of fungal, bacterial and viral diseases, mode of infection] diseases resistance and control measures, plant quarantine |
| November | Unit 3/ 10 | . A study of epidemiology and etiology of following plant diseases. Rust diseases of wheat, Tikka diseases of groung nut, Red rot of sugar can, Bacterial blight of rice, yellow vein mosaic of b hindi, Little Leaf of brinjal. |
| December | Unit /12 | Introduction to pollution, green house gases, Ozone depletion, Dissolve oxygen, B.O.D., C.O.D. Bio magnification Eutrophication, Acid precipitation, Pytoremediation. Plant indicators, Biogeographical Zones of India. |
| January | Unit 4/12 | , Concept of Biodiversity, CBD, MAB, National parks and biodiversity Hot spots, Conservation strategies, Red Data Book, IUCN threat categories, invasive species, endemic species. concept of sustainable development. |
| February | Unit 5/12 | ELEMENTARY BIOSTATISTICS: Introduction and application of Biostatics, measure of central tendency-Mean, Median, Mode, measures of dispersal-Standard deviation, standard error |

**CLASS: B.Sc. III year PAPER- II (GENETICS, MOLECULAR BIOLOGY, BIOTECHNOLOGY AND BIOCHEMISTRY)**

**Name of Teacher: Mr. Dorelal Madhukar**

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| Month | Title unit/ No. of lectures | Topic of lecture |
| July | Unit 1/10 | Cell and cell organelles, organization and morphology of chromosomes, giant chromosomes, cell division |
| August | unit 1 /  12 | Mendel's laws, gene interactions, linkage and crossing over, chromosomal aberration, polyploidy, sex linked inheritance, sex determination, cytolasmic inheritance, gene concept: cistron muton, recon |
| September | Unit 2/   13 | Nucleic acids, Structure and forms of DNA and RNA, DNA/RNA as genetic material, replication of DNA, biochemical and molecular basis of mutation, genetic code and its properties, |
| October | Unit 2/   13 | , mechanism of transcription and translation in prokaryotes, regulation of gene expression, Operon model. |
| November | Unit 3/  15 | Recombinant DNA, Enzymes in recombinant DNA technology, cloning vectors (Plasmid, Bacteriophages, Cosmids, Phagemids), gene cloning, PCR, Application of Biotechnology; G.M.Plants, Monoclonal antibodies, |
| December | Unit 3/2  Unit 4/ 10 | DNA finger printing  Protein: Chemical composition, primary, secondary and tertiary structure of Proteins. |
| January | Unit 4/12 | Carbohydrate: general account of monosaccharides, disaccharids and Polsaccharides Fat: Structure and properties of fats and fatty acids, synthesis and breakdown. |
| February | Unit 5/12 | ENZYMES: Nomenclature and classifaction, components of enzymes, theories of enzyme action, enzyme kinetics (Michaelis-Menten constant), allosteric enzymes, isozymes, Abzymes. Ribozymes, factors affecting enzyme activity. |

Remark

Signature of teacher Signature of H.O.D Signature of principal