

REAL TIME AI POWERED IMPLEMENTATION PROJECTS

JDNET TECHNOLOGIES CUDDALORE



9159395080



6369929654

FINAL YEAR PROJECTS

BOTANY

- ❖ PLANT PHYSIOLOGY AND BIOCHEMISTRY,
- ❖ PLANT TAXONOMY WITH AGRICULTURAL BOTANY,
- ❖ PLANT ECOLOGY AND ENVIRONMENTAL BIOLOGY,
- ❖ PLANT PATHOLOGY AND MICROBIOLOGY,
- ❖ GENETICS, MOLECULAR BIOLOGY, AND BIOTECHNOLOGY,
- ❖ ECONOMIC BOTANY AND MEDICINAL PLANTS

100 %
PLACEMENT
ASSISTANCE

NO:31, SUBBURAYA CHETTY STREET, THIRUPAPULIYUR, CUDDALORE-2
(OPP DARLING ELECTRONICS)

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PLANT PHYSIOLOGY AND BIOCHEMISTRY

1. Water relations in plants: absorption, ascent and transpiration
2. Mineral nutrition – macro- and micro-elements in plants
3. Membrane transport (osmosis, diffusion) in plant cells
4. Photosynthesis: light reaction and Calvin cycle
5. C₃, C₄ and CAM pathways in plants
6. Photorespiration and its significance
7. Respiration in plants: glycolysis, Krebs cycle, electron transport chain
8. Carbohydrate metabolism in plants
9. Lipid metabolism in plants
10. Protein and amino-acid metabolism in plants
11. Enzymology in plant systems
12. Growth regulators in plants: auxins, gibberellins, cytokinins, abscisic acid, ethylene
13. Seed germination, dormancy and seedling growth
14. Flowering physiology and photoperiodism
15. Fruit ripening and senescence in plants
16. Translocation of assimilates: phloem transport & source–sink relations
17. Stress physiology: drought, salinity, heat and cold in plants
18. Secondary metabolism in plants (alkaloids, phenolics, terpenes)
19. Signal transduction in plant physiology

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20. Plant water uptake, root pressure, capillarity
21. Stomatal physiology and transpiration control
22. Biochemical techniques: chromatography, spectrophotometry in plant science
23. Photosynthetic pigments and chloroplast structure
24. Nitrogen metabolism and nitrogen fixation in plants
25. Photo-protection and light stress in plants
26. Plant hormones: mode of action and interactions
27. Nutrient deficiency symptoms and toxicity in plants
28. Plant growth and development: phases and regulation
29. Biochemical basis of plant adaptation to environment
30. ATP generation and energy currency in plant cells
31. Role of mitochondria in plant metabolism
32. Reactive oxygen species and oxidative stress in plants
33. Plant cell signalling under biotic/abiotic stress
34. Soil–plant–water relationships
35. Uptake and transport of ions (K^+ , Ca^{2+} , Mg^{2+} , etc.)
36. CAM and succulence in arid-adapted plants
37. Photomorphogenesis and light perception in plants
38. Thermoregulation and plant responses to temperature
39. Biochemistry of plant pigments: carotenoids, anthocyanins

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PLANT TAXONOMY WITH AGRICULTURAL BOTANY

1. Principles of plant classification and botanical nomenclature
2. Systems of classification: artificial, natural and phylogenetic
3. Botanical nomenclature rules (ICN)
4. Plant identification: keys, herbarium sheets and field methods
5. Morphology of root, stem, leaf in plants
6. Morphology of flower, inflorescence, fruit and seed
7. Angiosperm taxonomy: major families and characteristics
8. Gymnosperm taxonomy and significance
9. Algae, Bryophytes and Pteridophytes: taxonomic overview
10. Fungi and Lichens – taxonomic importance in agriculture
11. Monocotyledons vs Dicotyledons: key differences
12. Taxonomy of crop plants (cereals, pulses, oilseeds)
13. Taxonomy of horticultural crops (fruits, vegetables)
14. Weed taxonomy: identification and agricultural impact
15. Economic plants taxonomy: fibre crops, timber trees, medicinal plants
16. Modern taxonomy: chemotaxonomy and molecular taxonomy
17. Botanical gardens, herbaria and plant collections
18. Botanical survey and flora preparation

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19. Taxonomy of invasive plant species in agriculture
20. Crop plant morphology and anatomy for agriculture
21. Agricultural botany: seed technology and seed morphology
22. Varietal identification and crop improvement taxonomy
23. Phytogeography and plant distribution in agricultural contexts
24. Domestication of plants and agricultural taxonomic changes
25. Plant breeding species concepts and classification
26. Systematics and phylogeny of crop plants
27. Morphological markers in plant taxonomy for crops
28. Taxonomic tools: keys, cladograms, phylogenetic trees
29. Role of taxonomy in plant genetic resources and conservation
30. Agricultural weeds: taxonomy and control
31. Botanical terminology and descriptive botanical grammar
32. Taxonomy of medicinal and aromatic plants
33. Crop wild relatives: taxonomy and resource use
34. Morphology and taxonomy of plantation crops (tea, coffee, rubber)
35. Classification of grasses (Poaceae) – major cereal family
36. Legume family (Fabaceae) taxonomy and agricultural importance
37. Taxonomy of oilseed and fibre crops
38. Seed-borne diseases and taxonomy of pathogens (bridge to pathology)

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PLANT ECOLOGY AND ENVIRONMENTAL BIOLOGY

1. Introduction to plant ecology: concepts and scope
2. Plant environment and ecological factors
3. Plant communities: structure, strata and dynamics
4. Ecosystem ecology: energy flow and nutrient cycles
5. Soil–plant ecosystem interactions
6. Water relations in plant ecology
7. Ecological adaptations of plants (xerophytes, hydrophytes, halophytes)
8. Population ecology of plants
9. Plant succession and climax communities
10. Biomes and plant distribution
11. Biodiversity: concept, measurement and importance in plants
12. Conservation biology of plants and habitats
13. Ecophysiology: linking physiology with ecology
14. Plant-microbe interactions in ecological perspective
15. Allelopathy in plant communities
16. Invasive plant species and ecological impact
17. Urban ecology and plants: green belts & urban forestry
18. Plant ecology of wetlands, mangroves and aquatic ecosystems

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19. Climate change impact on plant ecology
20. Carbon sequestration and plant ecosystems
21. Phytoremediation and plants in pollution control
22. Ecological restoration using plants
23. Plant ecology of grasslands and rangelands
24. Forest ecology and regeneration of crop/plant species
25. Plant phenology and seasonal behaviour
26. Interaction of plants with herbivores and pollinators
27. Functional ecology of plants: traits and strategies
28. Landscape ecology and plant spatial patterns
29. Microhabitats and plant population niches
30. Ecology of medicinal and wild plants in their habitats
31. Ecological aspects of agroforestry systems
32. Plant–soil feedbacks and ecological resilience
33. Ecosystem services provided by plants
34. Remote sensing and GIS applications in plant ecology
35. Ecological risk assessment of genetically modified crops
36. Plant ecology under stress: drought, salinity, temperature extremes
37. Succession in degraded agricultural land and plant cover restoration
38. Ecological genetics: adaptation and plant populations

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PLANT PATHOLOGY AND MICROBIOLOGY

1. Introduction to plant pathology: scope and significance
2. Causative agents: fungi, bacteria, viruses, nematodes
3. Disease cycle and epidemiology in plants
4. Host–pathogen interactions in plants
5. Plant disease symptoms, diagnosis and detection
6. Fungal diseases of crop plants
7. Bacterial diseases of crop plants
8. Viral and viroid diseases in plants
9. Nematode pests and plant diseases
10. Mycotoxins and their effects in agriculture
11. Plant disease resistance: genetic and induced
12. Integrated disease management in crops
13. Biocontrol of plant pathogens
14. Soil borne pathogens and rhizosphere microbiology
15. Seed-borne pathogens and seed health testing
16. Post-harvest diseases of fruits and vegetables
17. Microbial biotechnology in plant pathology
18. Epidemiological modeling of plant diseases
19. Pathogen variability and population genetics

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20. Fungal physiology and pathogenicity mechanisms
21. Bacterial virulence factors in plant disease
22. Viral replication and movement in plants
23. Plant immunity: PTI, ETI and systemic acquired resistance
24. Plant disease diagnostics: molecular tools (PCR, ELISA)
25. Crop diseases due to abiotic stress vs biotic stress
26. Host range and specificity of plant pathogens
27. Epidemiology in agro-ecosystems
28. Fungal-plant symbiosis vs pathogenicity
29. Microbial ecology in plant health and disease
30. Emerging plant diseases and climate change
31. Disease forecasting and management in agriculture
32. Pathogen detection technologies and remote sensing
33. Nanotechnology in plant disease control
34. Microbiome of the plant: beneficial vs harmful microbes
35. Seed treatment, fungicides & bactericides in crop protection
36. Resistance breeding and transgenic approaches in pathology
37. Pathogen life cycles and overwintering strategies
38. Disease management in horticultural and medicinal plants
39. Urban plant pathology and greenhouse disease management

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GENETICS, MOLECULAR BIOLOGY, AND BIOTECHNOLOGY

1. Mendelian genetics and inheritance in plants
2. Chromosomal aberrations and their effects in plants
3. Linkage, crossing over and mapping in plants
4. Population genetics and plant breeding principles
5. Molecular basis of gene expression in plants
6. DNA replication, repair and recombination in plants
7. Plant genome structure and evolution
8. Genetic engineering in plants: transgenic crops
9. Biotechnology tools: PCR, cloning, CRISPR in plants
10. Plant tissue culture and micropropagation
11. Somatic hybridization and protoplast culture in plants
12. Marker-assisted selection and molecular breeding
13. Genomics and transcriptomics in crop improvement
14. Proteomics and metabolomics in plants
15. Epigenetics and gene regulation in plants
16. Plant developmental biology and gene networks
17. Bioinformatics applications in plant biotechnology
18. Biotechnological production of secondary metabolites in plants

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19. Plant molecular physiology and signal transduction
20. Genetic resources and germplasm conservation
21. Polyploidy and its role in plant evolution
22. Synthetic biology for plant systems
23. RNA interference and gene silencing in plants
24. Plant microRNAs and regulatory RNAs
25. Plant-microbe interactions at molecular level
26. Crop improvement for biotic/abiotic stress tolerance using biotechnology
27. Biosafety, regulatory issues and GM crops
28. Molecular diagnostics in plant diseases
29. Nanobiotechnology in plant science
30. Functional genomics of crop plants
31. Genome editing and CRISPR technology in agriculture
32. Metabolic engineering in plants
33. Bioreactors and plant cell culture for industrial production
34. Systems biology in plant research
35. Transgenic trees and perennial crops
36. Plant synthetic promoters and cis-elements
37. Pharmacogenomics of medicinal plants
38. Plant plastid transformation and chloroplast biotechnology

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ECONOMIC BOTANY AND MEDICINAL PLANTS

1. Definition and scope of economic botany
2. Plant resources and their sustainable utilization
3. Crop plants for food security: cereals, pulses, oilseeds
4. Fibre crops: cotton, jute, linen and their botany
5. Timber and plantation crops: rubber, teak, eucalyptus
6. Horticultural crops: fruits, vegetables, ornamentals
7. Medicinal plants: definition, importance and classification
8. Ethnobotany and traditional plant use
9. Phytochemistry of medicinal plants: alkaloids, flavonoids, glycosides
10. Aromatic and spice plants: botany and uses
11. Industrial plants: latex, tannin, dye and gum producing plants
12. Biofuels and biomass plants
13. Non-wood forest products (NWFP) and minor forest produce
14. Agroforestry and multi-purpose trees
15. Medicinal plants cultivation and conservation
16. Herbal formulations and validated plant drugs
17. Economic botany of weeds: uses and management
18. Market chain and value-addition of plant products

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19. Bioprospecting and plant based pharmaceuticals
20. Global trade in medicinal and aromatic plants
21. Food plants and nutraceuticals
22. Plants as raw materials for industries (paper, fibre, biodegradable plastics)
23. Conservation of plant genetic resources for economic botany
24. Plantation agriculture: coffee, tea, cocoa, rubber, oil palm
25. Plants in environmental services: carbon sequestration, green economy
26. Medicinal plant taxonomy and identification
27. Biotechnology of medicinal plants: tissue culture, secondary metabolite production
28. Wild edible plants and under-utilised crops
29. Intellectual property rights in medicinal plant industry
30. Safety, efficacy and regulation of herbal medicines
31. Role of plants in ecosystem services and economy
32. Sustainable harvesting of medicinal and forest plants
33. Value-added products from medicinal plants
34. Indigenous knowledge systems and plant uses
35. Medicinal plant cultivation under protected conditions
36. Phytochemicals and clinical trials of plant extracts
37. Certification and standardization of herbal products
38. Economic botany of ornamental plants and floriculture

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