

SYLLABUS OF

Functional Group - Field/Lab Research - Category-II
- Technical Assistant (Field / Lab Research)

*Environmental Science / Life Science / Botany / Zoology / Microbiology /
Biotechnology/Biochemistry/Chemistry/Forestry/Agriculture*

Basics of Ecology; Population, Ecosystem-terrestrial, fresh water, marine; and its dynamics-food chains-food web, ecosystem functions. Energy flow; Bio-geochemical cycles. Biodiversity, its components, Natural Resources air, water, soil and its conservation and Forest Management, watershed management, Eco Restoration and the Development. Environmental Pollution-air, water, noise, soil; green house effect, acid rain, quality standards; Environmental Monitoring, Climate change, Environmental Techniques & Impact Assessment, GIS and Remote sensing.

Microscopy, Structure and organization of Prokaryote and eukaryote cell, Nutritional types, Growth curve, classification in bacteria, fungi, algae, etc, Viruses and bacteriophages, Microbial genetics, Biological nitrogen fixation, Biopesticides, Industrial utilization of micro-organisms - Alcohol fermentation -Microbes in pest and disease management, biofertilizers -di-nitrogen fixers, phosphorous solubilizers and P-mobilizers, Biochemistry of di-nitrogen fixation (BNF), nitrogen fixation by Azotobacter, Frankia, Rhizobium, Azorhizobium and Azospirillum, bio-remediation, plant pathogenic micro-organisms.

Cell structure and function, structure and function of carbohydrates, lipids, proteins and nucleic acids, synthesis of carbohydrate, glycolysis, Vitamins, hormones, antioxidants, anti-viral compounds, enzymes, protein engineering, Organization and structure of genomes; DNA structure and properties; DNA replication, repair and recombination; Central Dogma gene regulation, role of chromatin, chromatin remodeling, gene silencing, epigenetic regulation. Tissue culture, totipotency, Plant regeneration pathways, clonal propagation, embryo, endosperm and anther culture; protoplast culture, somatic hybrids; Cell suspension culture, production of secondary metabolites, hairy roots and bio-reactor technology, Gene cloning.

Molecules of Life, Cell Biology, Proteins, Enzymes, Metabolism of Carbohydrates and Lipids, Membrane Biology and Bioenergetics, Metabolism of Amino Acids and Nucleotides Gene Organization, Replication and Repair, Hormone Biochemistry and Function, Concepts in Genetics, Gene Expression and Regulation, Genetic Engineering and Biotechnology, Plant Biochemistry, Tools and Techniques in Biochemistry.



54

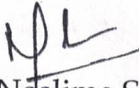
Biodiversity (Microbes, Algae, Fungi and Archegoniate), Plant Ecology and Taxonomy, Plant Anatomy and Embryology, Plant Physiology and Metabolism.

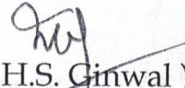
Animal Diversity, Comparative Anatomy and Developmental Biology, Physiology and Biochemistry, Taxonomy, Genetics and Evolutionary Biology, Embryology, Genetics, Molecular Biology, Evolution.


Molecules of Life, Atomic Structure, Bonding General Organic Chemistry & Aliphatic Hydrocarbons, Chemical Energetics, Equilibria & Functional Group Organic Chemistry, Conductance, Electrochemistry, Chemistry of s and p-block elements, States of matter and Chemical Kinetics, Bio molecules, Spectroscopy, Bio prospecting.

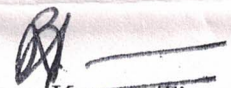
General Silviculture Forest soils - Soil conservation and management- Watershed development - General concept of tree improvement - Forest genetics resources and gene conservation - Biomass and Carbon estimation in forests and plantations - Forest types in India - Forest resources and utilization - Non-Timber Forest Products - Agroforestry.

Fundamentals of Agronomy and Agricultural Heritage, Fundamentals of Plant Biochemistry, Fundamentals of Soil Science, Introduction to Forestry, Introduction to Agricultural, Botany, Soil and Water Conservation Engineering, Fundamentals of crop Physiology, Fundamentals of Plant Pathology, Fundamentals of Microbiology, Fundamentals of Entomology, Principles of Seed Technology, Fundamentals of Genetics, Principles of plant disease management, Beneficial insects and Principles of Insect pest management, Problematic soils and their management, Soil and Applied Microbiology, Manures, Fertilizers and Soil Fertility Management, Plant Biotechnology.


(Smt. Neelima Shah)
Registrar, FRI


(Dr. H.S. Gihwal)
Dean, FRI DU


(N.C. Sarvaran)
ADG (Edu. and RB), ICFRE


(Dr. Rajeev Kumar Tiwari)
Secretary,
ICFRE

SYLLABUS OF RELEVANT SUBJECT

A. Functional Group-Maintenance-Category-II-Technical Assistant (Civil)

Shall include the syllabus of Diploma in Civil Engineering broadly comprising of Structural Engineering, Theory of Structures, Building Materials, Estimating Costing and Valuation, Hydraulics, Irrigation Engineering, Transportation Engineering, Concrete Technology RCC Design, Steel Design, Environmental Engineering, Surveying, Soil Mechanics.

B. Functional Group-Maintenance-Cat.-II- Technical Assistant (Electrical)

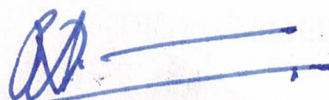
Shall include the syllabus of Diploma in Electrical Engineering broadly comprising of Basic concepts, Estimation and costing, Measurement and Measuring Instruments, Synchronous Machines, Utilization and Electrical Energy, AC Fundamentals, Circuit Law, Magnetic Circuit, Electrical Machines, Generation, Transmission and Distribution, Electrical Machines : (A) DC Machines (b) Single phase and three phase transformers (c) three phase induction motors, Fractional kilowatt motors, phase induction motors, basic electronics.

C. Functional Group-Maintenance-Cat.-II- Technical Assistant (Instrumentation)

Shall include the syllabus of Diploma in Instrumentation Engineering broadly comprising of Principles of electrical and electronics engineering, basic electrical circuits, instrumentation and process control, electronic circuits and devices, electronic components and materials, control systems, principles of instrumentation, power electronics, microprocessor and applications biomedical instrumentation.

D. Functional Group-Maintenance-Cat.-II- Technical Assistant (Computer Science / Information Technology)

Shall include the syllabus of Diploma level in Computer Science/Information Technology broadly comprising of Digital logic design, computer organization and architecture, computer networks, data structures using C, Database Management Systems, Object Oriented Programming with C++, Operating system, Software Engineering, Programming with Java, Web Programming, Software Testing, Network Security and Management, Information Storage and Management.


(Rajeev Kumar Tiwari)
Secretary, ICFRE