

Syllabus

Soil biota, Soil microbial ecology, Microbial Metabolism, Microbial genetics, Microbial interactions, Types of organisms, Symbiotic and non-symbiotic nitrogen fixation, Mycorrhizae, Elemental transformation and cycling: carbon, nitrogen, phosphorous, potassium and sulphur, Bioremediation, Soil enzymes, Microbial soil quality, Biofertilizers Pedogenic processes and their relationships with soil properties; Rocks, minerals and other soil forming materials; Soil texture, Soil structure and classification, Bulk density and particle density of soils and porosity; Humus, Humic acid, Fulvic acid; Soil moisture, Soil erosion, Land degradation; Soil colloids, Chemical equilibria, Chemical kinetics, Clay minerals, Adsorption desorption, Cation and Anion exchange, Soil organic matter; Essential elements in plant nutrition, Nutrient cycles in soil, Macro and micro nutrients in soil, Manures and fertilizers, Soil fertility and fertiliser use, Integrated nutrient management; Sustainable land use systems, Soil, plant, water and atmosphere relationships, Lime and gypsum requirement; Acid, Acid sulphate, Saline and Alkali soils and their management; Irrigation water quality, Major soil groups of India, Soil and water pollution, Greenhouse gases, Methods of soil analysis, Instrumentation

Agronomic techniques of production of major agricultural and horticultural crops, Cropping systems, Agrometeorology, Irrigation and drainage, Growth and development of crops in adverse environmental conditions, Dryland agriculture, Weeds and their management, Principal and methods of seed production of major crops; Requirements and types of seed storage; Farm mechanisation and equipment; Tillage and Pesticide application equipment, Precision agriculture. Major pests, diseases (fungal, bacterial and viral) and disorders of major agricultural and horticultural crops, Cultural, physical, biological, biotechnological, chemical and integrated management of pests and diseases Host plant defence Plant-pest relationships.

Climate change, carbon cycle, greenhouse gases and aerosols; greenhouse effect: temp, radiation, & energy, linking human dimension to climate change; sequestrations of atmospheric CO₂; impacts of climate change; accelerated mineral carbonation, clean coal technology, coalbed methane produced water, inorganic and organic pollutants of water; Eutrophication, DO, BOD, COD, sewage and groundwater pollution; status of water pollution in different water bodies with reference to Indian context, thermal pollution, sources, effect of soil pollution on biota, fate and behavior of soil pollutants; trace element pollution, impact of different pesticides on soil; different kinds of synthetic fertilizer (NPK) and their interactions with different components of soil; management of soil pollution in India, management of municipal solid waste, sewage sludge, composting, vermicomposting etc.; general impacts of some effluents discharged from paper and pulp industry, sugar, distillery, tannery, mining, sponge-iron etc. on ecosystem, fly ash and flue gas, environmental sources, biochemical effects, and soil, water and air pollution and remedial measures, Environmental impact assessment.

Agricultural Statistics: Measures of central tendency and dispersion; Sampling methods; Probability distribution, Design of experiments; Correlation and regression analysis; Tests of significance; Analysis of variance; Probit analysis.