UNIT-I: General: Importance of Agriculture in national economy; basic principles of crop production; cultivation of rice, wheat, chickpea, pigeon-pea, sugarcane, groundnut, rapeseed and mustard, potato. Major soils of India, role of NPK and their deficiency symptoms. Structure and function of cell organelles; mitosis and meiosis; Mendelian genetics: elementary knowledge of photosynthesis; respiration, photorespiration and transpiration; structure and functions of carbohydrates, proteins, nucleic acids, enzymes and vitamins. Major pests and diseases of rice, wheat, cotton, chickpea, sugarcane and their management. Important rural development programmes in India; organisational set up of agricultural research, education and extension in India; Elements of statistics.


UNIT-III: Field crops: Origin, distribution, economic importance, soil and climatic requirement, varieties, cultural practices and yield of cereals (rice, wheat, maize, sorghum, pearl millet, minor millets, barley), pulses (chickpea, lentil, peas, Pigeon pea, mungbean, urdbean), oilseeds (groundnut, sesame, soybean, rapeseed & mustard, sunflower, safflower, linseed), fiber crops (cotton, jute, sun hemp), sugar crops(sugarcane), fodder & forage crops (sorghum, maize, napier, berseem, Lucerne, oats), medicinal & aromatic plants (menthe, lemon grass and isabgol) and commercial crops(potato, tobacco).


UNIT-V: Water management: Principles of irrigation, Water resources and irrigation development in India, Water and irrigation requirements, Concepts and approaches of irrigation scheduling, Methods of irrigation, Measurement of irrigation water, application, distribution and use efficiencies, Conjunctive use of water, Irrigation water quality and its management, water
management in major field, crops (rice, wheat, maize, groundnut, sugarcane) Agricultural drainage.

**UNIT-VI:** Soil fertility and fertilizer use: Essential plant nutrients and their deficiency symptoms, concept of essentiality of plant nutrients, Indicators of soil fertility and productivity, Fertilizer materials and their availability to plants, slow release fertilizers, Nitrification inhibitors, Principles and methods of fertilizer application, Integrated nutrient management, site specific nutrient management.

**UNIT-VII:** Dryland Agronomy: Characteristics of Dryland farming and delineation of Dryland tracts, constraints of Dryland farming in India, Types of drought and their management, contingency crop planning and mid-season corrections for aberrant weather and its recycling. Watershed management.

**UNIT-VIII:** Problem soils: Problem soils and their distribution in India, Characteristics and reclamation of these soils, Crop production techniques in problem soils. **UNIT-IX:** Sustainable land use systems: Sustainable agriculture: parameters and indicators, Conservation agriculture, safe disposal of agri-industrial waste for crop production, Agro-forestry systems, shifting cultivation, Alternate land use systems, Wastelands and their remediation for crop production.