

Code 10 : MAJOR SUBJECT GROUP - AGRICULTURAL ENGINEERING AND TECHNOLOGY

(Subjects: 10.1 : Soil & Water Conservation Engineering / Water Resource Engineering, 10.2 : Irrigation & Drainage Engineering, 10.3 : Post Harvest Engineering / Food Engineering / Agril. Processing and Structure, 10.4 : Farm Implements & Machinery / Farm Power and Machinery / FP & Equip., 10.5: Bio - energy including Renewable Energy Management, Agricultural/Irrigation Water Management)

UNIT - I : Elementary Statistics and theory of probability, differential and integral calculus, linear algebra and Fourier series, differential equations, vector algebra & vector calculus, elementary numerical analysis.

UNIT - II: Electric motors: Types, performance, selection, installation and maintenance, measuring instruments, fundamentals of computers, power distribution.

UNIT - III : Thermodynamic principles; fluid mechanics, theory of machines

UNIT - IV : Soil mechanics, soil classification, compaction & shear strength of soils, engineering mechanics, strength of materials

UNIT - V : Importance of farm equipment and role of mechanization in enhancing productivity & profitability of Indian agriculture; analysis of forces, design and production of farm machinery and power units; mechanics of tillage & traction operation, repair and maintenance of farm machines and equipment, farm engines; tractors and power tillers; tractor stability and operators comfort; field capacity and cost analysis; test codes and procedure; safety and ergonomic principles. Role of energy in economic development; solar, wind and bio - energy; biogas plants & gasifiers; biofuels from biomass; collection, characterization and storage of biomass, solar cookers & solar refrigerators.

UNIT - VI : Biochemical and engineering properties of biological materials; quality control & safety of raw and finished products. Principles, practices and equipments for drying, milling, separation and storage of agricultural produce and by - products; material handling equipment and operations; farmstead planning; heating & cooling load calculation; seed processing practices and equipments; food preservation methods and products development; refrigeration and air conditioning; cold stores; waste management, cost analysis & food processing plants layout, feasibility reports.

UNIT - VII: Surveying and leveling; hydrology, water resources in India; efficiency in water use; irrigation system and equipment; water conveyances and associated efficiency; soil-plant-water relationship; estimation of evaporation and water requirements of crop; water harvesting and use, farm ponds and reservoirs, command area development, land use capability classification, ground water development, wells and pumping equipment, soil erosion and its control, land shaping and grading equipment and practices, hydraulic structures, drainage of irrigated and humid areas: salt balance and reclamation of saline and alkaline soils.