AGPE4001 GROUNDWATER, WELLS AND PUMPS (3-0-0)

Module-I Water Lifting Devices (8 hours)
Indigenous water lifts -Pumps - Positive displacement and variable displacement pumps, hydraulic ram -Reciprocating pump - Work done - coefficient of discharge – slip

Module-II Centrifugal Pump (8 hours)
Centrifugal pump-Volute-vortex-radial-mixed-axial-self priming, Installation-Troubles-Remedies Types- Multistage-Submersible-Turbine-Propeller-Jet-Air lift pumps, centrifugal pump-Work done -Head-static-dynamic-manometric, Minimum speed of impeller-Diameter of suction &delivery, Limitation of suction lift, NPSH, Characteristics- efficiencies- Specific speed

Module-III Water budgeting & Micro Irrigation (8 hours)
Micro irrigation-classification, Irrigation scheduling, Water Budgeting with micro-irrigation, Hydraulics of micro irrigation- components-Valves- planning factors-Wetting pattern- crop geometries

Module-IV Drip Irrigation design (8 hours)
Design of Drip Irrigation System; general considerations, wetting patterns, Irrigation requirement, Emitter selection, Hydraulics of Drip Irrigation system, design steps; necessary steps for proper operation of drip irrigation system; Maintenance of Micro Irrigation system: Clogging problems, filter cleaning, flushing and chemical treatment; Fertigation: advantages and limitation of fertigation, fertigation frequency, duration and injection rate, methods of fertigation.

Module-V Sprinkler Irrigation design (8 hours)
Sprinkler Irrigation: Ability, problems and prospects, types of sprinkler Irrigation systems; Design of sprinkler Irrigation system: Layout section, hydraulic design of lateral, submain and main pipelines, Design steps; section of pump and power units of sprinkler irrigation system; performance evaluation of sprinkler irrigation system: uniformity coefficient and pattern efficiency; Micro Irrigation system: Types- Drip, spray and bubbler systems, merits and demerits, different components.