Established by Govt. of Arunachal Pradesh vide Act 9 of 2012, the Arunachal University of Studies Act, 2012 Recognized as per u/s 2(f) of University Grants Commission Act, 1956 NH-52, Namsai, Arunachal Pradesh -792103

DIPLOMA (ELECTRICAL) – PART SIX

Optional Early Certificate: - N/A

Syllabus:-

Sr. No.	Module Code	Name of Module	Credits	Total Marks
1	EE41-26	Generation, Protection Switchgear & Economics	**5**	100
2	EE41-27	Modern Electric Traction System	**5**	100
3	EE41-28	Electrical Engineering Design & Drawing - II	**5**	100
4	EE41-29	Project	**4**	100

Module Name: Generation, Protection Switchgear & Economics

1. **Power Generation:** Generating Electrical Energy, Generating Stations, Hydro Electric Power Station, Diesel Power Station, Nuclear Power Station.
2. **Basics of Switchgear:** Introduction, Fuses, Isolators, Earthing Switches, Contractors, Circuit Breaker, Insulating Fluids, Initiation of an Arch in circuit Breakers, Arc Interruption, Current Interruption, Parallel Capacitance, Current Chopping, Resistance Switching, Capacitance Current Breaking.
3. **High Voltage Circuit Breakers:** Introduction, Oil Circuit Breakers, Air Circuit Breakers, Air Blast Circuit Breaker, Vacuum Breaker, High Voltage Direct Breaker, Circuit Breaker Testing.
4. **Protective Relays:** Basic Idea of Relay Protection, Nature and Cause of Faults, Primary and Backup Protection, Operation of Protective System, Relay Classification, Principle Types of Electromagnetic Relays, Induction Relays, Torque, Equation of Electromagnetic Relays, Instantaneous Over Current Relays, Application of Time Current Relays.
5. **Classification of Relays over their Construction:** Attracted Armature Type Relay, Induction Disc, Induction Cup Relay, Moving Coil Relay, Thermal Rays, Transductor Relays, Static Relays, Semiconductor Diodes, Transistor, Bipolar Junction Diode, Rectifier Bridge Relay.
6. **Economics of Power System:** Cost of Electrical Energy, Expressions of Electrical Energy, Methods of Determining Depreciation, Tarrif Plans, Desirable Characteristics of a Tariff Plan, Describe the types of tariffs.

Module Name: Modern Electric Traction System

1. **Electric Traction:** Types of electric traction, system of track electrification, Traction mechanics – types of services, Speed time curve and its simplification, average and schedule speeds, Tractive effort specific energy consumption, diesel traction system.
2. **Power Controlling Component:** Salient features of traction drives, Series-parallel control of dc traction drives and energy saving, Power Electronic control of DC and AC traction drives.
3. **Traction Drives:** Electric Traction Systems, Speed time curves, preliminary investigation of energy consumption and ideal speed torque characteristics of Traction motors.
4. **Protection of AC and DC Motors:** Constructional and Design aspects of AC 1 phase and 3 phase induction motors, DC motors, constraints and comparison with respect to commercial machines.
5. **Applications:** Battery operated vehicles for city service, light weight batteries, diesel-electric traction systems for main line service and controllers, mechanics of train movement.

Module Name: Electrical Engineering Design & Drawing - II

1. **House Wiring:** Definition and Positioning of Equipment, Arrangement of Apparatus, Locations of Various Outlets in House Wiring, Selection of Wires, Sub – circuits, Dividing the Electrical Installation into Sub – Circuits and Preparing an Installation Board.
2. **Service Line Connections:** Service Line, Types of Service Connections, Schedule of Material and Cost for Giving Service Connections.
3. **Wiring of Motors:** Wiring of Motors, Main Components used in Industrial Power Wiring, RCCB, ELCB, Mccb, Load Changeover Switches, Power Wiring Estimate, Lighting / Fan Wiring.
4. **Conductor Control Circuits:** Control Circuits, Conductor Control Circuit Components, Motor Control Circuits, Star – Delta Starters.
5. **Sub –** Stations: Classification of Sub-Stations, Lighting Arresters (LA) or Surge Diverters, Isolators, Circuit Breakers, Instrument Transformers, Bus Bars.