

GURUKUL EDUCATIONAL AND RESEARCH INSTITUTE

DIPLOMA IN ELECTRICIAN

Subject and Syllabus



2022-23

Syllabus

DIPLOMA IN ELECTRICIAN

DURATION:- 1 YEAR

122 FUNDAMENTALS OF ELECTRICAL ENGINEERING

Introduction to the Course. ...

Ohm and Kirchhoff's Law & Circuit Terminologies. ...

Series and Parallel Circuit and Calculating Equivalent Resistance. ...

Nodal and Mesh Analysis of the Electrical Circuit by Using KCL and KVL. ...

Circuit Theorems for Solving Electrical Circuit. ...

Fundamentals of the AC current.

Electric Machines

GURUKUL

EDUCATIONAL AND RESEARCH INSTITUTE, HARIDWAR

123 ELECTROMECHANICS

Introduction to electromagnetics: Maxwell's Equations, Magnetic Circuits and Induction, Principles of electromechanical energy conversion; Introduction to Rotating Machines: Types of electrical machines, generalized theory of electrical machines, Reference frame theory, space vector formulation; Unbalanced Magnetic Pull: definition, cause, effect and remedies, different winding scheme to reduce unbalanced magnetic pull; Magnetic Bearings: introduction, principles of magnetic suspension, mathematical modeling, hardware components which includes power amplifiers, sensors, actuators, controllers; Self-bearing machine: Basic principles, different methods of producing controllable force, introduction to self-bearing machine and control techniques; Finite element analysis of electromechanical devices: Solution of Laplace's and Poisson's equation, coupled circuit equation and field equation; Coupled rotordynamics combining electrical dynamics and mechanical dynamics: Coupled dynamics of electrical machines, dynamics and control of rotors on magnetic bearings; System fault analysis using electromechanical devices; Magnetostriction.

124 ANALOG AND DIGITAL ELECTRICAL CIRCUITS

Analog, digital microelectronic circuits and systems. Gate sizing, timing analysis, sequential digital circuits, memory. Single stage and differential amplifiers, frequency response.

125 PHYSICAL ELECTRONICS

Fundamentals of electrostatics and magnetostatics, transmission lines, impedance matching networks, electromagnetic (EM) waves, and basic operating principles of diodes and metal-oxide semiconductor field-effect transistors (MOSFETs). Designing MOSFET biasing, and single-ended and differential amplifier circuits. Basic operating principles of complementary metal-oxide semiconductor (CMOS) device and its application as a digital inverter. Electronic circuit design adhering to professional and ethical practices

126 COMMUNICATIONS ENGINEERING

VLSI Design System.
Digital Signal Processing.
Communication Systems.
Embedded System.
Robotics and Automation.
Wireless Communication System.
Communication Engineering.
Signal and Image Processing.