DIPLOMA PROGRAMME IN ELECTRICAL ENGINEERING
(For the State of Haryana)

1. SALIENT FEATURES

1.	Name of the Programme	:	Diploma Programme in **Electrical Engineering**
2)	Duration of the Programme	:	Three years (Six Semesters)
3)	Entry Qualification	:	Matriculation or equivalent as prescribed by State Board of Technical Education, Haryana
4)	Intake	:	40/60 (or as prescribed by the Board)
5)	Pattern of the Programme	:	Semester Pattern
6)	Ratio between theory and Practice	:	45 : 55 (Approx.)

7) Industrial Training:

Six weeks of industrial training is included after IV semester during summer vacation. Internal assessment out of 50 marks and external assessment out of another 50 marks will be added in 5th semester. Total marks allotted to industrial training will be 100.

Distribution of Marks:

- Daily diary and reports of training - 50 Marks
- Viva Voce (External) - 50 Marks

8) Ecology and Environment:

As per Govt. of India directives, a subject on Environmental Education has been incorporated in the scheme.

9) Entrepreneurship Development:

A subject on Entrepreneurship Development and Management has been incorporated in the scheme.

10) Student Centred Activities:

A provision of 5-6 hrs per week has been made for organizing Student Centred Activities for overall personality development of students. Such activities will comprise of co–curricular activities like extension lectures, library studies, games, hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defence/ Disaster Management activities etc**.**

2. EMPLOYMENT OPPORTUNITIES AND JOB/ACTIVITY PROFILE OF DIPLOMA HOLDERS IN ELECTRICAL ENGINEERING

(A) EMPLOYMENT OPPORTUNITIES

It is observed that employment in government/public sector undertakings are dwindling day by day. Keeping present scenario in view following employment opportunities are visualized in different sectors of employment for diploma holders in electrical engineering

(1) Manufacturing Industry (Mechanical)

The Electrical diploma holder will be involved in following activities in mechanical manufacturing industry:

- Planning and execution for Electrical installation
- Diesel Generation and Diesel Generating Set Maintenance
- Distribution of Electrical Power
- Maintenance of Industrial Electrical System
- Repair and Maintenance of Electrical Machines and Equipment
- Repair and Maintenance of Electronic Control Circuitry
- Testing and Standardization for Quality Control
- Energy Conservation

(2) Manufacturing Industry (Electrical and Electronics)

The Electrical diploma holder will be involved in following activities in Electrical and Electronics manufacturing industry:

- Assistance in Research and Development
- Assistance in Planning, Designing and Detailing
- Shop-floor Management including Quality Control
- Diesel Generation and Distribution
- Installation of Electrical Power Supply Systems
- Maintenance of Electrical and Electronic System(s)
- Repair and Maintenance of Electrical Machines/Equipment (including testing)
- Production
- Inventory Management
- Marketing and Sales

(3) Government Departments such as Electricity Board, MES, PWD, Railways, Air bases, Airports, Defence, Thermal, Hydro and Nuclear Power Stations and other Boards and Corporations

The Electrical diploma holder will be involved in following type of activities in above mentioned Government Departments:

- Assistance in Planning and Design of Electrical generation, transmission, distribution and protection system including testing, quality control
- Estimating for electrical installation
- Construction, erection and commissioning of lines and Sub-stations
- Electrical Safety measures
- Operation and Maintenance of Lines and Sub-stations/underground cables
- Tariffs and Calculations of bills for consumption of electricity
- Inventory Management
- Repair and Maintenance of Electrical Machines/ Equipment
- Operation and maintenance of Thermal, Hydro and Nuclear Power Stations

(4) Hospitals, Commercial Complexes, Service Sector Organizations like Hotels, Tourist-Resorts, high-rise buildings, Cinema/Theater Halls etc.

The diploma holder in electrical engineering will be involved in following type of activities in above mentioned Service Sector Organizations:

- Layout of wiring circuit, planning and execution for Electrical Installation
- Standby or captive Power Generation and its Distribution
- Maintenance of Electrical and Electronic Equipment
- Preventive Maintenance of Communication System, Lifts, Air-Conditioning Plants and Water Supply System
- Inventory Management
- Estimation for electrical repair and maintenance work

(5) Self Employment

Following type of self employment opportunities are available to the diploma holder in electrical engineering:

- Trading of Electrical Goods
- Establishing Repair and Maintenance Unit/ Centre
- Free Lancer for Repair and Maintenance of House-hold Electrical and Electronic Gadgets such as: Washing Machines, Geysers, Air Conditioners, Coolers and electrical installations etc.
- Electrical contractor
- Motor Winding Unit
- Auto-electrical Work
- Service sector

Can work as:

- Service and marketing engineer in the field of automation.
- Trainer of PLC and SCADA system.
- TSE (Technical Support Executive)

(B) JOB PROFILE/ ACTIVITY PROFILE

(1) Reading and interpreting drawings related to electrical machines, equipment, wiring installations

(2) Selecting right kind and quality of materials

(3) Preparing estimates for installation of control panels used in industry

(4) Preparing tender document as per given drawings

(5) Using measuring instruments, tools and testing devices for varied field applications

(6) Designing of control circuits for electrical machine control, control panels, wiring circuits etc.

(7) Understanding of constructional details, principle of working, characteristics and application of electrical machines, equipment, appliances and instruments

(8) Understanding of salient features and working principles of generation, transmission, distribution, protection and utilization of electrical power in different sectors

(9) Understanding of practices involved in erection, testing/installation and commissioning of electrical machines, equipment, control panels and systems

(10) Troubleshooting of electrical machines, wiring installations, equipment and control systems

(11) knowledge and awareness of: Power Tariff (Power Trade and Control), Indian Electricity rules, codes and Standards, Electrical Safety and Shock prevention Measures, Labour Management,

(12) Understanding of safety practices such as earthing, fire and shock prevention measures adopted in industry and service sector

(13) Understanding the principles of basic and digital electronics, microprocessors and micro-controller based systems and their applications in electrical control circuits

(14) Uses Information Technology and computers for various applications in the field of electrical engineering

(15) Knowledge and awareness of upcoming technologies of their field like PLC,SCADA and DCS System

(16) Good working knowledge of Electrical AutoCAD.

(17) Competencies in supervising shop floor/ work site operations

(18) Awareness about the environment, use of non-conventional energy sources, external financial and technical support system, and energy conservation techniques

(19) Knowledge of latest trends in the field of electronic controls, communication and instrumentation

3. COMPETENCY PROFILE OF DIPLOMA HOLDER IN ELECTRICAL ENGINEERING

Keeping in view the employment scenario and requirement of four domains of learning viz. Professional Development Domain, Continued Learning Domain, Human Relations Domain and Personal Development Domain, a diploma holder in Electrical Engineering should attain the:

(1) ability to read and interpret drawings related to electrical machines, equipment, wiring installations for light and power, motor control system using Programmable Logic Controllers (PLCs) and Micro-Processor based Process Control and protection systems

(2) competency in selection of right kind and quality of materials and preparation of estimates for installation of control panels used in industry

(3) ability to prepare tender document as per given drawings (i.e to prepare tender for material to be purchased)

(4) ability to use measuring instruments, tools and testing devices for varied field applications

(5) competency in the design of control circuits for electrical machine control, control panels, wiring circuits etc.

(6) understanding of constructional details, principle of working, characteristics and application of electrical machines, equipment, appliances and instruments

(7) understanding of salient features and working principles of generation, transmission, distribution, protection and utilization of electrical power in different sectors

(8) understanding of practices involved in erection, testing/installation and commissioning of electrical machines, equipment, control panels and systems

(9) ability for fault diagnosis and repair of electrical machines, wiring installations, equipment and control systems

(10) knowledge and awareness of:

- Power Tariff (Power Trade and Control)
- Indian Electricity rules, codes and Standards
- Electrical Safety and Shock prevention Measures
- Labour Management
- Team Working, Interpersonal Relations and Human Values
- Entrepreneurship Development (Self Employment)

- Concern for wastage
- Energy Management and Auditing

(11) understanding of safety practices such as earthing, fire and shock prevention measures adopted in industry and service sector

(12) understanding the principles of basic and digital electronics, microprocessors and micro-controller based systems and their applications in electrical control circuits

(13) ability to use Information Technology and computers for various applications in the field of electrical engineering

(14) knowledge of applied and engineering sciences for better comprehension of technologies used in electrical industry and service sector and to develop scientific temper, analytical skills and to facilitate continuing education

(15) competencies in general, manual and machining skills for supervising shop floor/ work site operations

(16) Ability to manage self for self development i.e. intellectually, physiologically, psychologically.

(17) Proficiency in oral and written communication, technical report preparation, managing relationship with juniors, pears and seniors for effective functioning in the world of work competency to communicate (oral and written) effectively in the professional life and develop self-learning habits

(18) Ability to collaborate, managing different tasks and to solve unstructured problems related to various functional areas of electrical engineering may it be prototype development, diagnostic and fault finding or repair and maintenance of plant and equipment

(19) understanding of basic principles of managing men, material and equipment and competency in organising men, material and machinery on shop floors techniques of achieving economy and quality

(20) awareness about the environment, use of non-conventional energy sources, external financial and technical support system, adopting energy conservation techniques

(21) Knowledge of latest trends in the field of instrumentation and various applications ie utilization of electric energy including Electric Traction

4. DERIVING CURRICULUM AREAS/SUBJECTS FROM COMPETENCY PROFILE

Sr. No.	Competency Profile	Curriculum Areas / Subjects
1.	Ability to read and interpret drawings related to electrical machines, equipment, wiring installations for light and power, motor control system using Programmable Logic Controllers (PLCs) and Micro-Processor based Process Control and protection systems	- Engineering Drawing - Drawings of Electrical Machines, Equipment, Installation and Control System - PLC and Microcontrollers
2.	Competency in selection of right kind and quality of materials and preparation of estimates for installation of control panels used in industry	- Electrical and Electronics Engg, Materials - Electrical Engineering Drawing - Electrical Estimation and Costing
3.	ability to prepare tender document as per given drawings(i.e to prepare tender for material to be purchased)	- Electrical Estimation and Costing - Engineering Drawing - AutoCAD
4.	Ability to use measuring instruments, tools and testing devices for varied field applications	- Electrical Measurements and Measuring Instruments - Instrumentation
5.	Competency in the design of control circuits for electrical machine control, control panels, wiring circuits etc.	- Electrical Design and Drawing - Electrical Workshop Practice
6.	Understanding of constructional details, principle of working, characteristics and application of electrical machines, equipment, appliances and instruments	- Electrical Machines - Utilization of Electrical Energy
7.	Understanding of salient features and working principles of generation, transmission, distribution, protection and utilization of electrical power in different sectors	- Transmission and Distribution of Electrical Power - Generation and Protection of Electrical Power - Utilization Electrical Energy
8.	Understanding of practices involved in erection/installation and commissioning of electrical machines, equipment, control panels and systems	- Installations and Management of Power Station
9.	Ability of fault diagnosis and repair of electrical machines, wiring installations, equipment and control systems	- Testing, repair and maintenance of Electrical Machines and other Installations and Control System - Electrical Workshop Practice

Sr. No.	Competency Profile	Curriculum Areas
10.	Knowledge and awareness of: - Power Tariff (Power Trade and Control) - Indian Electricity rules, codes and Standards - Safety and Shock prevention Measures - Labour Management - Team Working, Interpersonal Relations and Human Values - Entrepreneurship Dev. (Self Employment) - Concern for wastage	- Energy Management - Electrical Safety Measures - Project Work - Industrial Training - Entrepreneurship Development and Management - Employability Skills
11.	Understanding of safety practices such as earthing, fire and shock prevention measures adopted in industry and service sector	Electrical Workshop Practice
12.	Understanding the principles of basic and digital electronics, microprocessors and micro-controller based systems and their applications in electrical control circuits	- Electronics - Digital Electronics and Microprocessor - Programmable Logic Controllers (PLCs) and Microcontrollers - Microprocessor based Process Control
13.	Ability to use Information Technology and computers for various applications in the field of electrical engineering	- Basics of Information Technology - Computer Programming and Applications
14.	Knowledge of applied and engineering sciences for better comprehension of technologies used in electrical industry and service sector and to develop scientific temper, analytical skills and to facilitate continuing education	- Applied Physics - Applied Chemistry - Applied Mathematics - Workshop Practice (Electrical and Mechanical)
15.	Competencies in general, manual and machining skills for supervising shop floor/ work site operations	- Workshop Practice - Electrical Workshop Practice - Industrial Training
16.	Ability to manage self for self development i.e. intellectually, physiologically, psychologically.	Employability Skills
17.	Proficiency in oral and written communication, technical report preparation, managing relationship with juniors, pears and seniors for effective functioning in the world of work competency to communicate (oral and written) effectively in the professional life and develop self-learning habits	- Communication Techniques/ Skills - Project Work - Exposure to World of Work - Entrepreneurship Development and Management - Employability Skills

Sr. No.	Competency Profile	Curriculum Areas(Subjects)
18.	Ability to collaborate, managing different tasks and to solve unstructured problems related to various functional areas of electrical engineering may it be prototype development, diagnostic and fault finding or repair and maintenance of plant and equipment	- Repair and Maintenance of Electrical Installations - Electrical Engineering Drawing, - Estimation and Costing in Electrical Engineering - Entrepreneurship Development and Management
19.	Understanding of basic principles of managing men, material and equipment and techniques of achieving economy and quality, labour laws, Intellectual Property Rights(IPR)	- Entrepreneurship Development and Management
20..	Awareness about the environment, use of non-conventional energy sources, external financial and technical support system, adopting energy conservation techniques	- Environmental Science
21.	Knowledge of latest trends in the field of instrumentation and various applications i.e. utilization of electric energy including Electric Traction	- Instrumentation - Optical Fibre Communication - Electric Traction

5. ABSTRACT OF CURRICULUM AREAS/SUBJECTS

a) Basic Sciences and Humanities

1. English and Communication Skills – I & II
2. Employability Skills – I & II
3. Environmental Education
4. Entrepreneurship Development and Management

b) Applied Sciences

5. Applied Mathematics –I& II
6. Applied Physics I & II
7. Applied Chemistry I & II

c) Basic Courses in Engineering/Technology

8. Engineering Drawing
9. General Workshop Practice
10. Basics of Information Technology

d) Applied Courses in Engineering/Technology

11. Fundamentals of Electrical Engineering
12. Electronics-I
13. Electrical and Electronics Engineering Materials
14. Electrical Measurements and Measuring Instruments
15. Electronics-II
16. Digital Electronics and Microprocessors
17. Electrical Machines I&II
18. Estimating and Costing in Electrical Engineering
19. Electrical Engineering Design and Drawing
20. Electrical Power-I
21. Electrical Workshop Practice
22. Computer Programming and Applications
23. Industrial Electronics and Control of Drives
24. Electrical Power-II
25. Minor Project Work

26. Utilization of Electrical Energy(UEE)
27. PLCs and Microcontrollers
28. Major Project Work

e) Specialized Courses in Engineering/Technology)

29. Energy Management
30. Optical Fibre Communication
31. Installation and Maintenance of Electrical Equipment

6. HORIZONTAL AND VERTICAL ORGANISATION OF THE SUBJECTS

Sr. No.	Subject	Distribution of time in various semesters					
		I	II	III	IV	V	VI
1.	Communication Skills	5	5	-	-	-	-
2.	Applied Mathematics	5	5	-	-	-	-
3.	Applied Physics	6	6	-	-	-	-
4.	Applied Chemistry	5	5	-	-	-	-
5.	Basics of Information Technology	4	-	-	-	-	-
6.	Engineering Drawing	6	6	-	-	-	-
7.	General Workshop Practice	6	6	-	-	-	-
8.	Electrical and Electronics Engineering Materials	-	-	4	-	-	-
9.	Fundamentals of Electrical Engineering	-	6	-	-	-	-
10.	Electronics	-	-	6	7	-	-
11.	Electrical Engineering Design and Drawing	-	-	6	6	-	-
12.	Computer Programming and Applications	-	-	6	-	-	-
13.	Electrical Workshop Practice	-	-	6	-	-	-
14.	Electrical Machines	-	-	-	7	7	-
15.	Electrical Measurements and Measuring Instruments	-	-	6	-	-	-
16.	Instrumentation	-	-	-	6	-	-
17.	Estimating and Costing in Electrical Engineering	-	-	-	4	-	-
18.	Energy Sources and Management of Electrical Energy	-	-	-	4	-	-
19.	Employability Skills	-	-	-	-	2	2
20.	Electrical Power	-	-	-	-	4	6
21.	Industrial Electronics and Control of Drives	-	-	-	-	7	-
22.	Digital Electronics and Microprocessors	-	-	-	-	8	
23.	Environmental Education	-	-	-	-	3	-
24.	Minor Project Work	-	-	-	-	3	-
25.	Utilization of Electrical Energy	-	-	-	-	-	5
26.	PLCs and Microcontrollers	-	-	-	-	-	8
27.	Elective	-	-	-	-	-	4
28.	Entrepreneurship Development and Management	-	-	-	-	-	3
29.	Major Project Work	-	-	-	-	-	6
30.	Student Centered Activities	3	1	6	6	6	6
	Total	**40**	**40**	**40**	**40**	**40**	**40**