

DIPLOMA PROGRAMME IN ELECTRICAL ENGINEERING

1. SALIENT FEATURES

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| 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 |
| 5. | Pattern of the Programme | : | Semester Pattern |
| 6. | Ratio between theory and Practical classes | : | 50 : 50 (Approx.) |

2. EMPLOYMENT OPPORTUNITIES FOR DIPLOMA HOLDERS IN ELECTRICAL ENGINEERING

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 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 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 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, 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 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, Gysers, Air Conditioners, Coolers and electrical installations etc.
- Electrical contractor
- Motor Winding Unit
- Auto-electrical Work
- Service sector

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 have 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
- (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
 - Safety and Shock prevention Measures
 - Labour Management
 - Technical Report-writing Skills
 - 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) proficiency in oral and written communication, technical report writing, managing relationship with juniors, peers and seniors for effective functioning in the world of work
 - (17) competency in solving simple 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
 - (18) understanding of basic principles of managing men, material and equipment and techniques of achieving economy and quality
 - (19) awareness about the environment, use of non-conventional energy sources, external financial and technical support system, adopting energy conservation techniques

4. CURRICULUM AREAS/SUBJECTS DERIVED 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	<ul style="list-style-type: none"> - Basic Graphic and Drawing Skills - Electrical Machines, Equipment, - Installation and Control System - Programmable Logic Controllers (PLCs) - Microprocessor based Process Control - Power Electronics
2.	Competency in selection of right kind and quality of materials and preparation of estimates for installation of control panels used in industry	<ul style="list-style-type: none"> - Basic Electrical and Electronics Engg, Engineering materials - Electrical Engineering Drawing - Estimation and Costing
3.	Ability to prepare tender document as per given drawings	Electrical Estimation and Costing
4.	Ability to use measuring instruments, tools and testing devices for varied field applications	Electrical and Electronic Instruments and Measurements
5.	Competency in the design of control circuits for electrical machine control, control panels, wiring circuits etc.	<ul style="list-style-type: none"> - Design and Drawing of wiring and control circuits - Electrical Workshop Practice
6.	Understanding of constructional details, principle of working, characteristics and application of electrical machines, equipment, appliances and instruments	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Transmission and Distribution of Electrical Power - Generation and Protection of Electrical Power
8.	Understanding of practices involved in erection/installation and commissioning of electrical machines, equipment, control panels and systems	Erection Commissioning and operation of Electrical Machines and Installations
9.	Ability for fault diagnosis and repair of electrical machines, wiring installations, equipment and control systems	Testing, repair and maintenance of Electrical Machines and Installations

Sr. No.	Competency Profile	Curriculum Areas
10.	Knowledge and awareness of: <ul style="list-style-type: none"> - Power Tariff (Power Trade and Control) - Indian Electricity rules, codes and Standards - Safety and Shock prevention Measures - Labour Management - Technical Report-writing Skills - Team Working, Interpersonal Relations and Human Values - Entrepreneurship Dev. (Self Employment) - Concern for wastage 	<ul style="list-style-type: none"> - Energy Management - Electrical Safety Measures - Entrepreneurship Development and Management - Communication Skills - Project Work - Entrepreneurship Development and Management
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	<ul style="list-style-type: none"> - Digital Electronics and applications - Programmable Logic Controllers (PLCs) - Microprocessor based Process Control
13.	Ability to use Information Technology and computers for various applications in the field of electrical engineering	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Workshop Practice - Electrical Workshop Practice
16.	Proficiency in oral and written communication, technical report writing, managing relationship with juniors, peers and seniors for effective functioning in the world of work	<ul style="list-style-type: none"> - Communication Techniques/ Skills - Project Work - Exposure to World of Work
17.	Competency in solving simple 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	<ul style="list-style-type: none"> - Repair and Maintenance of Electrical Installations - Electrical Engineering Drawing, - Estimation and Costing in Electrical Engineering -

Sr. No.	Competency Profile	Curriculum Areas(Subjects)
18.	Understanding of basic principles of managing men, material and equipment and techniques of achieving economy and quality	<ul style="list-style-type: none"> - Entrepreneurship Development and Management - Management Techniques - Professional Studies
19.	Awareness about the environment, use of non-conventional energy sources, external financial and technical support system, adopting energy conservation techniques	<ul style="list-style-type: none"> - Environmental and Entrepreneurial Awareness - Non-Conventional Sources of Energy

5. ABSTRACT OF CURRICULUM AREAS/SUBJECTS

a) Basic Sciences and Humanities

1. Communication Skills
2. Entrepreneurship Development and Management

b) Applied Sciences

3. Applied Mathematics
4. Applied Physics
5. Applied Chemistry

c) Basic Courses in Engineering/Technology

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

d) Applied Courses in Engineering/Technology

11. Fundamentals of Electrical Engineering
12. Basic Electronics
13. Electrical and Electronics Engineering Materials
14. Electronic Devices and Circuits
15. Electrical Measurement and Measuring Instruments
16. Digital Electronics and Microprocessors
17. Electrical Machines
18. Estimating and Costing in Electrical Engineering
19. Electrical Engineering Design and Drawing – I
20. Power-I (Generation, Transmissions and Distribution of Electrical Power)
21. Electrical Workshop Practice
22. Computer Programming and Applications
23. Minor Project Work
24. Industrial Electronics and Control of Drives
25. Power-II (Protection of Electrical Power System)
26. Utilization of Electrical Energy
27. Installation and Maintenance of Electrical Equipment
28. Major Project Work

e) Specialised Courses in Engineering/Technology)

(Electives-I, to choose any one from the following)

29. Instrumentation
30. Power Plant Engineering
31. PC Maintenance and Repair

(Electives-II, to choose any one from the following)

32. Energy Management
33. Optical Fibre Communication
34. Modern Electric Traction System

6. HORIZONTAL AND VERTICAL ORGANISATION OF THE SUBJECTS (ELECTRICAL ENGINEERING)

Sr. No.	Subjects	Time Distribution in Hours/week in Various Semesters					
		I	II	III	IV	V	VI
1.	Communication Skills	5	5	-	-	-	-
2.	Applied Mathematics	5	5	-	-	-	-
3.	Applied Physics	6	5	-	-	-	-
4.	Applied Chemistry	4	4	-	-	-	-
5.	Basics of Information Technology	4	-	-	-	-	-
6.	General Engineering	-	5				
7.	Engineering Drawing	6	6	-	-	-	-
8.	General Workshop Practice	6	6		-	-	-
9.	Electrical and Electronics Engineering Materials	-	-	4	-	-	-
10.	Fundamentals of Electrical Engineering	-	-	6	-	-	-
11.	Basic Electronics	-	-	6	-	-	-
12.	Electrical Engineering Design and Drawing	-	-	8	7	-	-
13.	Computer Programming and Applications	-	-	6	-	-	-
14.	Electrical Workshop Practice	-	-	6	6		
15.	Electrical Machines	-	-	-	7	8	
16.	Electrical Measurement and Measuring Instruments	-	-	-	6	-	-
17.	Electronic Devices and Circuits	-	-	-	6	-	-
18.	Estimating and Costing in Electrical Engineering	-	-	-	4	-	-
19.	Power-I (Generation, Transmission and Distribution of Electrical Power)	-	-	-	-	5	-
20.	Industrial Electronics and Control of Drives	-	-	-	-	7	-
21.	Elective –I	-	-	-	-	4	-
22.	Digital Electronics and Microprocessors	-	-	-	-	7	-
23.	Minor Project Work	-	-	-	-	3	-
24.	Utilisation of Electrical Engineering	-	-	-	-	-	4
25.	Installation and Maintenance of Electrical Equipment	-	-	-	-	-	8
26.	Power-II (Power System Protection)	-	-	-	-	-	5
27.	Elective – II	-	-	-	-	-	4
28.	Entrepreneurship Development and Management	-	-	-	-	-	3
29.	Major Project Work	-	-	-	-	-	12
30.	Student Centred Activities	4	4	4	4	4	4
Total		40	40	40	40	40	40