

Ramgarhia Polytechnic College, Phagwara



Electrical Engineering Department

Head of Department:	S. Jasvir Singh
Name of the Faculty:	Er. Medha Walia
Discipline:	Electrical Engineering Department
Semester:	3 rd
Subject:	Electrical Engineering Design and Drawing
Lesson Plan Duration:	16 Weeks

RATIONALE

A student of electrical engineering is supposed to have ability to:














- i) Read, understand and interpret engineering drawings
- ii) Communicate and co-relate through sketches and drawings
- iii) Prepare working drawings of panels, transmission and distribution.

The contents of this subject has been designed to develop requisite knowledge and skills of electrical drawings in the students of diploma in electrical engineering.

Learning Outcomes

After undergoing this course, the students will be able to:

- CO1. Recognise various electrical devices and their symbols
- CO2. Recognise various electrical devices placed on the panels/distribution boards and to design the panels.
- CO3. Recognise the internal details of various electrical machines and devices.
- CO4. Read schematic and wiring diagrams of electrical devices.
- CO5. Read and interpret electrical installation plan.
- CO6. Communicate about circuits and devices through sketches and drawings.

PO \Rightarrow	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO \Downarrow							
CO1							
CO2							
CO3							
CO4							
CO5							
CO6							
CO7							
CO8							
CO9							

Syllabus

Units	Details	Hours
1.	Symbols and Signs Conventions Various Electrical Symbols used in Domestic and Industrial Installation and Power System as per BIS Code.	(3 Sheets)
2.	Panels/Distribution Boards Design and Drawing of panels/Distribution board using MCBS, ELCB main switches and change over switches for domestic installation, industrial and commercial installation.	(3 Sheets)
3.	Orthographic projections of Simple Electrical Parts Bus bar post/ Kit Kat 101 Pin type and shackle type insulator (Pin Type 11kV/66kV) Bobbins of a small transformer / choke Stay insulators/Suspension type insulators	(4 Sheets)
4.	Orthographic Projection of Machine Parts Rotor of a squirrel cage induction motor. Motor body (induction motor) as per IS Specifications (using outside dimensions) Slip rings of 3-phase induction Motor. Stator of 3 phase Induction motor (Sectional View)	(4 Sheets)
5.	Contactor Control Circuits: Schematic and wiring diagram DOL Starter of 3-phase induction Motor. Forwarding/reversing of 3-phase induction motor Limit switch control of a 3-phase induction motor Sequence operation of two motors using T.D.R. Two speed motor control. Automatic star-delta starter for 3-phase induction motor.	(6 Sheets)

Reference Books:

1. Electrical Engineering Design and Drawings by Surjeet Singh, Dhanpat Rai and Co, New Delhi
2. Electrical Engineering Drawing by Surjit Singh, SK Kataria and Sons, New Delhi

Delivery/Instructional Methodologies

Sr.No.	Description
1.	Chalk and Talk
2.	PowerPoint Presentation

Assessment Methodologies

Sr. No.	Description	Type
1.	Student Assignment	Direct
2.	Test	Direct
3.	Board Examination	Direct
4.	Student Feedback	Direct

Gaps in the syllabus - to meet industry/profession requirements

S.NO.	DESCRIPTION	PROPOSED ACTIONS	PO MAPPING
1	N/A	N/A	N/A

Topics beyond syllabus/advanced topics

Units	Details	Hours
N/A	N/A	N/A

Web Source References

Sr. No.	URL
1.	https://nptel.ac.in/

Lesson Plan

Week	Theory		Practical	
	Lecture Day		Practical Day	
1 st	1 st		1 st	Symbols and Signs Conventions Various Electrical Symbols used in Domestic and Industrial Installation and Power System as per BIS Code.
			2 nd	
			3 rd	
			4 th	
			5 th	
			6 th	
			7 th	
			8 th	
2 nd			9 th	Design and Drawing of panels/Distribution board using MCBS, ELCB main switches and change over switches for domestic installation Industrial installation. Commercial installation.
			10 th	
			11 th	
			12 th	
			13 th	
			14 th	
			15 th	
			16 th	
3 rd			17 th	Commercial installation.
			18 th	
			19 th	
			20 th	
			21 st	
			22 nd	
			23 rd	
			24 th	
4 th			25 th	Orthographic projections of Simple Electrical Parts
			26 th	
			27 th	
			28 th	
			29 th	
			30 th	
			31 st	

			32 nd	Bus bar post/ Kit Kat Pin type and shackle type insulator (Pin Type 11kV/66kV)
5 th			33 rd	
			34 th	
			35 th	
			36 th	
			37 th	
			38 th	
			39 th	
			40 th	
6 th			41 st	REVISION
			42 nd	
			43 rd	1st Sessional Test (Tentative)
			44 th	
			45 th	Orthographic projections of Simple Electrical Parts
			46 th	
			47 th	
			48 th	
7 th			49 th	Bobbins of a small transformer / choke
			50 th	
			51 st	Stay insulators/Suspension type insulators
			52 nd	
			53 rd	
			54 th	
			55 th	
			56 th	
8 th			57 th	Orthographic Projection of Machine Parts
			58 th	
			59 th	
			60 th	Rotor of a squirrel cage induction motor
			61 st	
			62 nd	
			63 rd	
			64 th	
			65 th	

9 th			66 th	Orthographic Projection of Machine Parts Motor body (induction motor) as per IS Specifications (using outside dimensions) Slip rings of 3-phase induction Motor. Stator of 3 phase Induction motor (Sectional View)	
			67 th		
			68 th		
			69 th		
			70 th		
			71 st		
			72 nd		
10 th			73 rd	Contactor Control Circuits: Schematic and wiring diagram DOL Starter of 3-phase induction Motor.	
			74 th		
			75 th		
			76 th		
			77 th		
			78 th		
			79 th		
11 th			80 th	Forwarding/reversing of 3-phase induction motor	
			81 st		
			82 nd		
			83 rd		
			84 th		
			85 th		REVISION
			86 th		
87 th					
88 th					
12 th			89 th	Contactor Control Circuits: Schematic and wiring diagram Limit switch control of a 3-phase induction motor	
			90 th		
			91 st		
			92 nd		
			93 rd		PTM 2nd Sessional Test (Tentative)
			94 th		
			95 th		
96 th					
			97 th	Contactor Control Circuits: Schematic and wiring diagram	
			98 th		
			99 th		

13 th			100 th	Sequence operation of two motors using T.D.R.
			101 st	
			102 nd	
			103 rd	
			104 th	
14 th			105 th	Contactor Control Circuits: Schematic and wiring diagram
			106 th	
			107 th	Two speed motor control.
			108 th	
			109 th	Automatic star-delta starter for 3-phase induction motor.
			110 th	
			111 st	
			112 nd	
15 th			113 rd	Revision Using Autocad
			114 th	
			115 th	
			116 th	
			117 th	Revision Using Autocad
			118 th	
			119 th	
			120 th	
16 th			121 st	PTM
			122 nd	
			123 rd	
			124 th	
			125 th	3rd Sessional Test (Tentative)
			126 th	
			127 th	
			128 th	

NBA has defined the following seven POs for an Engineering diploma graduate:

- i) **Basic and Discipline specific knowledge:** Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
- ii) **Problem analysis:** Identify and analyze well-defined engineering problems using codified standard methods.
- iii) **Design/ development of solutions:** Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.
- iv) **Engineering Tools, Experimentation and Testing:** Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
- v) **Engineering practices for society, sustainability and environment:** Apply appropriate technology in context of society, sustainability, environment and ethical practices.
- vi) **Project Management:** Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.
- vii) **Life-long learning:** Ability to analyze individual needs and engage in updating in the context of technological changes.

Program Specific Outcomes (PSOs)

PSOs are a statement that describes what students are expected to know and be able to do in a specialized area of discipline upon graduation from a program. Program may specify 2-4 program specific outcomes, if required.

These are the statements, which are specific to the particular 11 program. They are beyond POs. Program Curriculum and other activities during the program must help in the achievement of PSOs along with POs.