

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Diploma Engineering				Branch	ELECTRICAL ENGINEERING			
Semester	IV				Version	1.0.0.0			
Effective from Academic Year		2019-20			Effective for the batch Admitted in			June 2018	
Subject code	1EE2402		Subject Name		TRANSMISSION AND DISTRIBUTION OF ELECTRICAL POWER				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	4	0	1	0	5	Theory	40	60	100
Hours	4	0	2	0	6	Practical	30	20	50

Pre-requisites:
None

Course Learning Outcomes:
<p>The course content should be taught and implemented with an aim to develop different skills leading to the achievement of the following competencies and course learning outcomes:</p> <p>T1. To understand transmission and distribution system-O.H and U.G.</p> <p>T2. To apply modern technology for transmission and distribution of electrical power.</p> <p>T3. To develop new skills to reduces T &amp; D losses in power system.</p> <p>T4. To implement new ideas for making T &amp; D system more powerful and efficient.</p> <p>T5. To Verify pros and cons of new technologies on environment/community.</p> <p>The practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate course learning outcomes.</p>

Course Content						
Name of UNIT	Unit Content		Unit Learning Outcomes		Marks	Hrs
TRANSMISSION LINE COMPONENTS	1a.	Features of different transmission system.	1.1	Classification of transmission lines	16	16
	1b.	Need for various insulators.	1.2	Different types of transmission systems.		
	1c.	Features of different transmission towers.	1.3	Types of conductors-copper, aluminium: Solid, Stranded and bundled conductors.		
	1d.	Features of different types of conductors.	1.4	Line insulators-requirement, types, failure of insulator.		
	1e.	Sag and String efficiency.	1.5	String efficiency and its equation and sag calculation.		
PERFORMANCE OF TRANSMISSION LINES	2a.	Various effects on transmission line-Skin effect, proximity effect, Ferranti effect and corona effect.	2.1	Skin effect, proximity effect and Ferranti effect ,corona effect	14	14
	2b.	Effect of efficiency and	2.2	Transmission of conductors.		

	<p>regulation on transmission line.</p> <p>2c. Effect of low power factor on the performance.</p> <p>2d. Effects of R, L and C on 1-ph and 3-ph transmission line.</p> <p>2e. Features of the short, medium and long transmission lines.</p> <p>2f. Importance and functions of the load dispatch centre.</p>	<p>2.3 Losses, efficiency and regulation of line.</p> <p>2.4 Performance of single phase short transmission line.</p> <p>2.5 Effect of load power factor on performance of transmission line.</p> <p>2.6 Features of short, medium and long transmission line.</p> <p>2.7 Load dispatch centre.</p>		
EHV TRANSMISSION	<p>3a. Need of EHV transmission.</p> <p>3b. Features of HVAC transmission.</p> <p>3c. Features of HVDC transmission.</p> <p>3d. Flexible AC Transmission System.</p>	<p>3.1 Advantages of EHV transmission.</p> <p>3.2 Line diagram of HVAC system and its advantages and limitations.</p> <p>3.3 Line diagram of HVDC system and its advantages and limitations.</p> <p>3.4 Comparison of HVDC and HVAC system.</p> <p>3.5 State the equipments used in HVDC system and application of HVDC system.</p> <p>3.6 FACTs and its advantages.</p>	08	08
DISTRIBUTION SYSTEM COMPONENTS	<p>4a. Classify Distribution system.</p> <p>4b. Types of AC distribution system.</p> <p>4c. Importance of distribution system.</p> <p>4d. Main elements of distribution system.</p> <p>4e. Connection schemes for distribution system.</p>	<p>4.1 Various distribution system.</p> <p>4.2 Types of AC distribution system with diagram.</p> <p>4.3 Necessity of distribution system.</p> <p>4.4 Functions of feeder, distributors and service mains.</p> <p>4.5 Various methods of connection for distribution system-radial, ring main and interconnected system.</p>	08	08
SUBSTATION AND CABLE	<p>5a. Role of substation and function of it.</p> <p>5b. Classify the substation.</p> <p>5c. Compare indoor and outdoor substation.</p> <p>5d. Factors for site selection and layout of substation.</p> <p>5e. Various substations like-transformer, pole mounted and underground substation.</p> <p>5f. Equipments used in</p>	<p>5.1 Working of substation.</p> <p>5.2 Types of substation on various bases.</p> <p>5.3 Features of Indoor and outdoor cable.</p> <p>5.4 Key points for layout and site selection.</p> <p>5.5 Functions of various equipments used in s.s.</p> <p>5.6 Importance of control room and battery room</p>	14	14

	substation.	5.7	General construction of cable.		
5g.	Necessity of control room and battery room.	5.8	Merits and demerits of U.G. cable over O.H. line.		
5h.	Construction and working of cable.	5.9	Construction and Working of different cables.		
5i.	Advantages and disadvantages of underground cable over overhead line	5.10	Use of cable.		
5j.	Constriction of various cable like, LT, Belted, SL, HSL etc.				
5k.	Applications of cable.				

#### List of Practical

No.	Unit	Name of Practical
1	1	Prepare a reports on various types of transmission towers with diagram.
2	1	Prepare a reports on various types of insulators and bushing with diagram.
3	1	Prepare a report on various types of cable used in distribution system by visiting nearby cable supplier
4	2	Numericals on various transmission system
5	3	Prepare technical report on Load Dispatch Center.
6	4	Prepare a report on distribution system for residential consumer.
7	5	Prepare a report on substation after visit.
8	5	Prepare chart of various instruments/equipments used in substation.
9	5	Interpret and explain blue print of substation.
10	5	To draw a sheet of pole mounted substation with necessary parts and labled it.
11	5	To study about construction of underground cable and its application.
12	5	Prepare a report on construction and working of cable after visit.
13	5	Use of earth tester and meggar.

#### List of Instruments / Equipment / Trainer Board

1	3-phase transmission line trainer
2	11kv pin ,33 kv string insulators
3	Different types of 1-phase and 3-phase armoured and unarmoured cable
4	Meggar and earth tester.
5	Samples/demo pieces of various equipments used in substations.

#### List of Reference Books

No	Title of Reference Books	Authors	Publication
1	Electrical Power Transmission and Distribution	Sivanagaraju S. Satyanarayana S.	Pearson Learning, New Delhi
2	Transmission and Distribution of electrical energy	Gupta J. B.	S. K. Khanna publication
3	A Course in electrical Power	Soni-Gupta-Bhatnagar	Dhanpat Rai, New Delhi

#### Link of Learning Web Resource

1	<a href="http://gatewaywestproject.com/faq_general_transmission">http://gatewaywestproject.com/faq_general_transmission</a>
2	<a href="http://youtube.com/insulators">http://youtube.com/insulators</a>
3	<a href="http://youtube.com/cables_construction">http://youtube.com/cables_construction</a>