

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 1/5
Branch	Electrical & Electronics Engineering		Semester	4	
Course Code	402	Course Name	Generation, Transmission & Distribution		
Course Outcome 1	Comprehend conventional and non-conventional sources of Energy.			Teach Hrs	Marks
Learning Outcome E0540211	Describe various sources of Energy. [Cognitive Domain]			08	10
Contents	<ul style="list-style-type: none"> ➤ Classification of energy sources: Renewable and non-renewable, Conventional and non-conventional, Commercial and non commercial. ➤ Constructional features, operating principle and working of wind, solar, geo-thermal, fuel-cell, bio-gas, MHD and tidal power plants. 				
Method of Assessment	Internal: Mid semester-I theory examination (Pen paper test)				
Learning Outcome E0540212	Elaborate the concept of conventional power plants. [Cognitive Domain]			08	10
Contents	<ul style="list-style-type: none"> ➤ Schematic diagram of Thermal, Hydro, Nuclear and Diesel power plants. ➤ Site selection, advantages and disadvantages of above mentioned plants. ➤ Comparative analysis of all the above mentioned plants. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0540213	Connect solar panels for different output requirements. [Psychomotor domain]			8	10
Contents	<ul style="list-style-type: none"> ➤ To connect PV modules in series and measure resultant output (voltage & current). ➤ To connect PV modules in parallel and measure resultant output (voltage & current). 				
Method of Assessment	External: Performance of given task and viva voce				
Learning Outcome E0540214	Identify various electrical devices installed at generating station. [Affective & Psychomotor domain]			8	10
Contents	<ul style="list-style-type: none"> ➤ To conduct a visit of any conventional or non conventional generating station. 				
Method of Assessment	Internal: Viva voce & report submission.				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 2/5
Branch	Electrical & Electronics Engineering		Semester	4	
Course Code	402	Course Name	Generation, Transmission & Distribution		
Course Outcome 2	Illustrate the concept of Load, Economics of power generation and Tariff.			Teach Hrs	Marks
Learning Outcome E0540221	Describe the concept of load and economics of power generation. [Cognitive Domain]			12	15
Contents	<ul style="list-style-type: none"> ➤ Types of loads: Domestic, Industrial, Commercial, Agricultural loads ➤ Technical terminology regarding load: connected load, firm power, average load, maximum demand, reserve capacity, hot reserve, cold reserve, spinning reserve, load curve, load duration curve, demand factor, load factor, diversity factor, plant capacity factor, plant use factor & Numerical problems. ➤ Various terms regarding economics of generation: interest, depreciation, fixed cost, semi fixed cost, operating cost, cost of per unit energy generation & Numerical problems. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0540222	Practice modern and conventional aspects of electricity tariff. [Cognitive Domain]			08	10
Contents	<ul style="list-style-type: none"> ➤ Desirable characteristics of tariff for domestic, commercial and industrial applications. ➤ Types of conventional & renewable energy tariff: Block rate, Flat rate, Two part, Power factor, Time of day, Net metering tariff & Numerical problems. ➤ LV and HV tariff: Brief description only. ➤ Provision of incentives & Rebate in tariff. 				
Method of Assessment	Internal: Quiz & Assignment.				
Learning Outcome E0540223	Execute load survey for different analysis. [Psychomotor Domain]			08	10
Contents	<ul style="list-style-type: none"> ➤ To carry out load survey and plot load curve, load duration curve of a domestic load. ➤ To carry out load survey and plot load curve, load duration curve of a commercial load. ➤ To calculate normal energy bill of a domestic consumer and verify it with original bill. ➤ To calculate net metering bill of a commercial consumer and verify it with original bill. 				
Method of Assessment	Internal: Performance of given task and viva voce				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 3/5
Branch	Electrical & Electronics Engineering		Semester	4	
Course Code	402	Course Name	Generation, Transmission & Distribution		
Course Outcome 3	Describe various aspects of overhead transmission lines and underground cables.			Teach Hrs	Marks
Learning Outcome E0540231	Identify various elements while installing overhead transmission lines & underground cables. [Cognitive Domain]			08	10
Contents	<ul style="list-style-type: none"> ➤ Line conductor – materials, types and their trade name. ➤ Line supports – requirements, types and specification of different tower structures: RCC poles, Steel poles, Lattice steel towers. ➤ Ground clearance, Sag calculation (for level supports only), effect of ice, wind and temperature on Sag, Sag template, Stringing chart. ➤ Numerical problems on Sag. ➤ Methods of laying underground cable. ➤ Comparison between overhead transmission lines & underground cables. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0540232	Carry out the study of line insulators. [Cognitive Domain]			08	10
Contents	<ul style="list-style-type: none"> ➤ Types of insulators and their applications. ➤ Potential distribution over a string of suspension insulator. ➤ Determination of String efficiency of a string of 3 units & Numerical problems. ➤ Methods of improving string efficiency. ➤ Testing of insulators for determining puncture strength and flashover 				
Method of Assessment	Internal: Mid semester-II theory examination (Pen paper test)				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 4/5
Branch	Electrical & Electronics Engineering		Semester	4	
Course Code	402	Course Name	Generation, Transmission & Distribution		
Course Outcome 4	Determine Electrical performance of transmission lines.			Teach Hrs	Marks
Learning Outcome E0540241	Explain electrical aspects of overhead transmission lines. [Cognitive Domain]			04	05
Contents	<ul style="list-style-type: none"> ➤ Classification of transmission lines: On the basis of voltage and line length. ➤ Introductory concept of electrical parameters R, L and C of transmission line (no derivations). ➤ Concept of high voltage DC (HVDC) transmission with the help of block diagram. ➤ Types of HVDC links: Monopolar & Bipolar. ➤ Comparison of HVDC system with HVAC 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0540242	Present various phenomena associated with transmission lines. [Cognitive Domain]			08	10
Contents	<ul style="list-style-type: none"> ➤ Transposition, Skin effect, Ferranti effect and Proximity effect. ➤ Performance evaluation of short and medium transmission lines (π & T Model): sending end voltage, sending end current, sending end power factor, voltage regulation, transmission efficiency & Numerical problems ➤ Overview of Corona – power loss, advantages and disadvantages, methods of reducing corona in brief. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0540243	Evaluate performance of transmission lines. [Psychomotor Domain]			08	10
Contents	<ul style="list-style-type: none"> ➤ To determine V_R, I_R, $\cos \phi_R$, voltage regulation and transmission efficiency of short transmission line. ➤ To determine V_R, I_R, $\cos \phi_R$, voltage regulation and transmission efficiency of medium transmission line (T Model). ➤ To determine V_R, I_R, $\cos \phi_R$, voltage regulation and transmission efficiency of medium transmission line (π Model). 				
Method of Assessment	External: Performance of given task and viva voce				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 5/5
Branch	Electrical & Electronics Engineering		Semester	4	
Course Code	402	Course Name	Generation, Transmission & Distribution		
Course Outcome 5	Explore AC Distribution system and Distribution sub-station.			Teach Hrs	Marks
Learning Outcome E0540251	Give details of AC distribution system. [Cognitive Domain]			12	15
Contents	<ul style="list-style-type: none"> ➤ Characteristics of an ideal distribution system. ➤ Components – feeder, distributor and service mains. ➤ Classification on the basis of voltage (primary and secondary) and configuration (radial and ring-main). ➤ Concept of radial, ring-main and micro-grid distribution system. ➤ Voltage and current distribution in different sections of radial and ring-main distribution system. Numerical problems. ➤ Comparison of radial and ring-main distribution system. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0540252	Outline the overview of distribution sub-station. [Cognitive Domain]			04	05
Contents	<ul style="list-style-type: none"> ➤ Requirement of distribution substation. ➤ Classification of Distribution substation. ➤ Site selection, advantages and disadvantages. ➤ Concept of GIS (Gas Insulated Substation): Difference with normal substation, advantages. 				
Method of Assessment	External: End semester theory examination (Pen paper test)				
Learning Outcome E0540253	Calculate voltage and current in different sections of Distributors. [Psychomotor Domain]			08	10
Contents	<ul style="list-style-type: none"> ➤ To determine voltage drop and current in different sections of radial distributors for concentrated loading. ➤ To determine voltage drop and current in different sections of ring-main distributors for concentrated loading. 				
Method of Assessment	External: Performance of given task and viva voce.				

Reference Books:

1. Gupta, J.B. A Course in Electrical Power– S. K Kataria and Sons, New Delhi. 2014.
2. Nag. P. K. Power Plant Engineering, McGraw Hill, New Delhi, ISBN: 978-9339204044
3. Gupta, B.R., Generation of Electrical Energy, S. Chand & Co. New Delhi
4. Kothari, D.P. et al: Renewable Energy Sources and Emerging Technologies, PHI Learning, New Delhi, ISBN: -978-81-203-4470-9
5. Mehta, V.K., Principles of Power System, S. Chand and Co. New Delhi, ISBN: 9788121924962
6. Sivanagaraju S.; Satyanarayana S., Electrical Power Transmission and Distribution, Pearson Education, New Delhi, , ISBN:9788131707913
7. Uppal,S.L., A Course in Electrical Power, S.K.Khanna Publisher New Delhi, ISBN : 9788174092380
8. Kamraju, V., Electrical Power Distribution System, Tata McGraw-Hill, New Delhi, ISBN:9780070151413
9. Singh, S. N. Electric Power Generation, Transmission & Distribution, PHI Publication.
10. Wadhwa, C. L. Generation, Distribution & Utilization of Electrical Energy, New Age International Publication.
11. Leonard, L Grigsby Electric Power Generation, Transmission & Distribution, Taylor & Francis Ltd.