"PVC" NSSK Govt. Polytechnic Bilaspur at Kalol
Lecture Planning (Theory)

Branch : **Electrical Engg.** Semester: 5th
Subject : ENERGY CONSERVATION AND AUDIT Session: AUG- DEC, **25**
Teacher : **Jyoti Bala** Cass Room :

Sr. No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Remarks
1.	1-12	Energy Conservation Basics	Energy Scenario: Primary and Secondary Energy, Energy demand and supply, National scenario. Energy conservation and Energy audit; concepts and difference Star Labelling: Need and its benefits	R1,R2, R3,R4,R5,R6,R-7,R-8.R-9	
2.	13-29	Energy Conservation in Electrical Machines	Need for energy conservation in induction motor. Energy conservation techniques in induction motor by: Motor survey Matching motor to load. Operating in star mode. Rewinding of motor. Replacement by energy efficient motor, Periodic maintenance Energy efficient motor; significant features, advantages, applications and limitations. Need for energy conservation in transformer: Energy efficient transformers, amorphoustransformers; epoxy Resin cast transformer / Dry type of transformer.	-do-	
3.	30-46	Energy conservation in Electrical Installation systems	Aggregated Technical and commercial losses (ATC); Power system at state, regional, national and global level. Technical losses; causes and measures to reduce these (no expression only theory part) a) Controlling I 2R losses. b) Optimizing distribution voltage c) Balancing phase currents Energy conservation in lighting sources: a) Replacing Lamp sources. b) Using energy efficient luminaries	-do-	
4.	47-64	Energy conservation through Cogeneration and Tariff	Co-generation and Tariff; concept, significance for energy conservation Co-generation Types of cogeneration on basis of sequence of energy use (basic introduction to Topping cycle & Bottoming cycle) Types of cogeneration basis of technology (Steam turbine cogeneration, Gas turbine cogeneration). Factors governing the selection of cogeneration system, advantages of cogeneration. Tariff: Types of tariff structure: Special tariffs; Time-off-day tariff, Peak-off-day tariff, Power factor tariff, Maximum Demand tariff, Load factor tariff. Application of tariff system to reduce energy bill.	-do-	

5.	65-80	Energy Audit of Electrical System	Energy audit (definition as per Energy Conservation Act)Energy audit instruments and their use. Questionnaire for energy audit projects. Energy flow diagram (Sankey diagram)	-do-	

01/08/25

Signature of Teacher with Date

Signature of HOD (EE)

Reference Resource:

R-1. Guide Books No. 1 and 3 for National Certification Examination for Energy Managers and Energy Auditors, Bureau of Energy Efficiency (BEE), Bureau of Energy Efficiency (A Statutory body under Ministry of Power, Government of India) (Fourth Edition 2015).

R- 2. O.P. Gupta, Energy Technology, Khanna Publishing House, New Delhi

R-3. Henderson, P. D., India - The Energy Sector, University Press, Delhi, 2016. ISBN: 978-0195606539

R-4. Turner, W. C., Energy Management Handbook, Fairmount Press, 2012, ISBN 9781304520708

R-5. Sharma, K. V., Venkataseshaiah; P., Energy Management and Conservation, I K International Publishing House Pvt. Ltd; 2011 ISBN 9789381141298

R- 6. Mehta ,V. K., Principles of Power System, S. Chand &Co. New Delhi, 2016, ISBN 9788121905947

R-7. Singh, Sanjeev; Rathore, Umesh, Energy Management, S K Kataria & Sons, New Delhi ISBN13:9789350141014.

R-8. Desai, B. G.; Rana, J. S.; A. Dinesh, V.; Paraman, R., Efficient Use and Management of Electricity in Industry, Devki Energy Consultancy Pvt. Ltd.

R-9. Chakrabarti, Aman, Energy Engineering And Management, e-books Kindle Edition