|  |  |  |  |
| --- | --- | --- | --- |
| **Lesson plan** | | | |
| **Name of Faculty** | | | Sh. Rajiv Kumar |
| **Discipline** | | | Electrical Engineering |
| **Semester** | | | 6th |
| **Subject** | | | Electrical Energy Conservation and Management |
| **Lesson Plan Duration** | | | 15 week, Theory: 05 |
| **Week** | **Theory** | | |
|  | **Lecture**  **Day** | **Topic ( Including Assignment/ Test)** | |
| 1st | Day1 | **1 Lighting System** | |
| Day2 | 1.1. Basic definitions- Lux, lumen and illumination space to height ratio | |
| Day3 | 1.2Types of different lamps and their features | |
| Day4 | 1.3 Energy efficient practices in lighting | |
| Day5 | 1.4.Tips for energy saving in building - New Building, Existing Building | |
| 2nd | Day1 | 1.5Laws of Illumination | |
| Day2 | 1.6 Calculation of illumination at different points, Main requirements for proper lighting | |
| Day3 | 1.7Macro level approach at design stage | |
| Day4 | Revision/ Assignment | |
| Day5 | **2 Energy Conservation and EC Act 2001** | |
| 3rd | Day1 | Introduction to energy management, energy conservation, energy efficiency and its need | |
| Day2 | Salient features of Energy Conservation Act 2001 & | |
| Day3 | The Energy Conservation (Amendment) Act, 2010 and its importance | |
| Day4 | Standards and Labeling - Concept of star rating and its importance, Types of product  available for star rating | |
| Day5 | Revision/ Assignment | |
| 4th | Day1 | Class Test | |
| Day2 | **3 Energy Audit** | |
| Day3 | Types and methodology | |
| Day4 | Energy auditing reporting format | |
| Day5 | Energy audit instruments | |
| 5th | Day1 | Revision/ Assignment | |
| Day2 | 4 **Electrical Supply System and Motors** | |
| Day3 | Types of electrical supply system | |
| Day4 | Single line diagram | |
| Day5 | Transformer loading | |
| 6th | Day1 | Tips for energy savings in transformers | |
| Day2 | Motor Loading | |
| Day3 | Variation in efficiency and power factor with loading | |
| Day4 | Tips for energy savings in motors | |
| Day5 | Need for energy efficient motors | |
| 7th | Day1 | Initial cost versus like cycle cost | |
| Day2 | Cost analysis on life cycle basis | |
| Day3 | Various constructional features of EEMs | |
| Day4 | EEM as compared to standard motors | |
| Day5 | Revision/ Assignment | |
| 8th | Day1 | **5 Energy Efficiency in Electrical Utilities** | |
| Day2 | Understanding Electricity Bill , Tariff structure | |
| Day3 | Components of power (kW, kVA and kVAR) and power factor | |
| Day4 | Concept of sanctioned load, maximum demand, contract demand and monthly minimum  charges (MMC) | |

|  |  |  |
| --- | --- | --- |
|  | Day5 | **5.2 Pumps;** Introduction to pump and its application, Efficient pumping system operation, |
| 9th | Day1 | Energy efficiency in agriculture pumps, Tips for energy saving in pumps, |
| Day2 | **5.3 Compressed Air System** Types of air compressor and its applications, |
| Day3 | Leakage test, Energy saving opportunities in compressors |
| Day4 | **5.4 Energy Conservation in HVAC and Refrigeration System;** Introduction |
| Day5 | Concept of Energy Efficiency Ratio (EER) |
| 10th | Day1 | Energy saving opportunities in Heating, Ventilation and |
| Day2 | Air-conditioning (HVAC) and Refrigeration Systems |
| Day3 | **5.5 Thermal Basics**: Types of fuels, Thermal energy |
| Day4 | Energy contents in fuel, Energy Units and |
| Day5 | its conversion in terms of metric ton of oil equivalent (MTOE) |
| 11th | Day1 | Revision/ Assignment |
| Day2 | Class Test |
| Day3 | **6 General Energy Saving Tips;** Lighting System, Room Air Conditioners |
| Day4 | Refrigerators, Water Heater, Computers, |
| Day5 | Fans, Heaters |
| 12th | Day1 | Blowers and Washing Machines |
| Day2 | Water Pumps |
| Day3 | Kitchens, Transport |
| Day4 | Revision/ Assignment |
| Day5 | **Class Test** |
| 13th | Day1 | **7 Energy Conservation Building Code** |
| Day2 | Haryana ECBC and its salient features including thermal behavior of buildings |
| Day3 | ECBC Guidelines on Building Envelope |
| Day4 | ECBC Prescriptive Requirements for Building Envelope |
| Day5 | ECBC Guidelines on Heating, Ventilation and Air Conditioning |
| 14th | Day1 | ECBC Guidelines on Service Hot Water and Pumping |
| Day2 | ECBC Guidelines on Lighting |
| Day3 | ECBC Guidelines on Electrical Power |
| Day4 | ECBC Guidelines on Star Labelling and Minimum Star rating |
| Day5 | Revision/ Assignment |
| 15th | Day1 | **Class Test** |
| Day2 | Revision/Review/Test of old HSBTE Papers |
| Day3 | Revision/Review/Test of old HSBTE Papers |
| Day4 | Revision/Review/Test of old HSBTE Papers |
| Day5 | Revision/Review/Test of old HSBTE Papers |