

# Lesson Plan

**Name of the faculty :** POONAM SHARMA  
**Discipline :** Electrical  
**Semester :** 6th  
**Subject :** Utilization of electrical engineering  
**Lesson Plan Duration :** 15 weeks (from January 18 to April 2018)

## Work load (Lecture/Practical) per week (55 minutes) : Lectures-05

| Week | Theory      |  |
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|      | Lecture day | Topic (Including assignment/test)  |
| 1st  | 1st         | Introduction   |
|      | 2nd         | Nature of light, visibility spectrum curve of relative sensitivity of human eye and wave length of light   |
|      | 3rd         | Definition: Luminous flux, solid angle, luminous intensity, illumination, luminous efficiency, depreciation factor, coefficient of utilization, space to height ratio, reflection factor, glare, shadow, lux.                    |
|      | 4th         | Laws of illumination simple numericals   |
|      | 5th         | Different type of lamps, construction and working of incandescent , fittings required for filament lamp,   |
| 2nd  | 1st         | construction and working of discharge lamps – their characteristics,mercury vapour sodium lamp, fluorescent lamp,  |
|      | 2nd         | halogen lamp, neon lamp construction and working   |
|      | 3rd         | compact filament lamp(CFL), LED Lamp, comparison of incandescent, fluorescent, CFL & LED   |
|      | 4th         | Calculation of number of light points for interior illumination, calculation of illumination at different points, considerations involved in simple design problems.   |
|      | 5th         | Illumination schemes; indoor and outdoor illumination levels   |
| 3rd  | 1st         | Main requirements of proper lighting   |
|      | 2nd         | absence of glare, contrast and shadow  |
|      | 3rd         | Awareness about time switches, street lighting, flood lighting, monument lighting and decorative lighting, light characteristics etc.  |
|      | 4th         | Advantages of electrical heating   |
|      | 5th         | Resistance heating – direct and indirect resistance heating, electric ovens, their temperature range, properties of resistance heating elements, domestic water heaters and other heating appliances, thermostat control circuit |
| 4th  | 1st         | Induction heating; principle of core type and coreless induction furnace, their construction and applications  |
|      | 2nd         | Electric arc heating; direct and indirect arc heating, construction, working and applications of arc furnace   |
|      | 3rd         | Dielectric heating, applications in various industrial fields  |
|      | 4th         | Infra-red heating and its applications (construction and working of two appliances   |
|      | 5th         | Microwave heating and its applications (construction and working of two appliances   |
| 5th  | 1st         | Solar Heating Calculation of resistance heating elements (simple problems)   |
|      | 2nd         | Calculation of resistance heating elements (simple problems)   |
|      | 3rd         | revision & Copy check  |
|      | 4th         | revision & Copy check  |
|      | 5th         | Advantages of electric welding   |
|      | 1st         | Welding method 3.2.1 Principles of resistance welding, types – spot, projection, seam and butt welding,  |
|      | 2nd         | welding equipments   |

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| 6th  | 3rd | Principle of arc production, electric arc welding, characteristics of arc; carbon arc   |
|      | 4th | metal arc, hydrogen arc welding method and their applications.  |
|      | 5th | Power supply requirement. Advantages of using coated electrodes, comparison between AC and DC arc welding, welding control circuits, welding of aluminum and copper |
| 7th  | 1st | revision & Copy check   |
|      | 2nd | . Electrolytic Processes: (10 hrs) 4.1 Need of electro-deposition   |
|      | 3rd | 2 Laws of electrolysis, process of electro-deposition - clearing, operation, deposition of metals, polishing and buffing  |
|      | 4th | Equipment and accessories for electroplating  |
|      | 5th | Factors affecting electro-deposition  |
| 8th  | 1st | Principle of galvanizing and its applications   |
|      | 2nd | 6 Principles of anodizing and its applications  |
|      | 3rd | Electroplating of non-conducting materials 4.8 Manufacture of chemicals by electrolytic process<br>Power supplies for electroplating                                |
|      | 4th | Electrical Circuits used in Refrigeration, Air Conditioning and Water Coolers,introduction  |
|      | 5th | 5.1 Principle of air conditioning, vapour pressure, refrigeration cycle,  |
| 9th  | 1st | eco-friendly refrigerants   |
|      | 2nd | Description of Electrical circuit used in Refrigerato   |
|      | 3rd | Description of Electrical circuit used in Air-conditioner   |
|      | 4th | Description of Electrical circuit used in Water cooler  |
|      | 5th | revision & Copy check   |
| 10th | 1st | Advantages of electric drives   |
|      | 2nd | Characteristics of different mechanical loads   |
|      | 3rd | Types of motors used as electric drive  |
|      | 4th | Electric braking Plugging   |
|      | 5th | Rheostatic braking  |
| 11th | 1st | Regenerative braking  |
|      | 2nd | General idea about the methods of power transfer by direct coupling by using devices like belt drive, gears, chain drives etc.                                      |
|      | 3rd | Examples of selection of motors for different types of domestic loads   |
|      | 4th | Selection of drive for applications such as general workshop, textile mill, paper mill, steel mill, printing press, crane and lift etc.                             |
|      | 5th | Application of flywheel.  |
| 12th | 1st | Specifications of commonly used motors e.g. squirrel cage motors,   |
|      | 2nd | Specifications of commonly used motors slip ring induction motors,  |
|      | 3rd | Specifications of commonly used motors AC series motors,  |
|      | 4th | Specifications of commonly used motors Fractional kilo Watt(FKW) motors   |
|      | 5th | Specifications of commonly used motors Fractional kilo Watt(FKW) motors   |
| 13th | 1st | Selection of motors for Domestic Appliances   |
|      | 2nd | revision & Copy check   |
|      | 3rd | Electric Traction: (10 hrs)   |
|      | 4th | Advantages of electric traction over other types of traction. 7.2 Different systems of electric traction, DC and AC systems, diesel electric system                 |
|      | 5th | Types of services – urban, sub-urban, and main line and their speed-time curves   |
| 14th | 1st | Different accessories for track electrification; such as overhead catenary wire, conductor rail system, current collector-pentagraph                                |
|      | 2nd | Factors affecting scheduled speed 7   |
|      | 3rd | Electrical block diagram of an electric locomotive with description of various equipment and accessories used.  |
|      | 4th | Types of motors used for electric traction  |
|      | 5th | Power supply arrangements   |

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| 15th | 1st | Starting and braking of electric locomotives  |
|      | 2nd | Introduction to EMU and metro railways  |
|      | 3rd | Train Lighting Scheme Note: Students should be taken for visits to nearest electrified railway track and railway station to study the electric traction system. |
|      | 4th | revision & Copy check   |
|      | 5th | revision & Copy check   |