

## Faculty of Engineering & Technology

### Utilization of Electrical Energy

#### Information :

**Course Code :** EPR 513

**Level :** Undergraduate

**Course Hours :** 3.00- Hours

**Department :** Specialization of Electrical Power Engineering

#### Instructor Information :

Title	Name	Office hours
Lecturer	MARIAM AHMED SAMEH MOHAMAD AHMED ABBADI	9
Teaching Assistant	Abeer Tharwat Said Awad	

#### Area Of Study :

The Main Goals of this course are:

- To know the different applications of electrical energy.
- To develop the design of lighting schemes.
- Apply the modes of heat transfer in different mediums.
- To understand the traction systems.
- To identify, formulate and solve traction problems.
- To understand the importance of electric welding.
- To share ideas and work in a team or group.

#### Description :

Electrical traction systems, Mechanical and electrical characteristics, Speed curves, Operations during electrical traction, Electrical traction motors, Modern control of traction motors. Illumination: Artificial illumination requirements and characteristics, Standard specifications, Types of lamps and luminaries, Illumination curves, Installation of lamps, Luminaries and connections, gas filled lamp ignition. Electric heating: Resistance wires, Electric furnaces, Dielectric heating. Electric welding of metals: Welding transformers and generators, Arc welding, Spot welding. Electrolytic processes: Metal coating. Electric transportation: Cranes and hoists, Elevators and conveyor belts, Paper .

#### Course outcomes :

##### **a.Knowledge and Understanding: :**

1 -	Demonstrate knowledge and understanding of components and concepts of utilization of electrical Energy
2 -	Demonstrate knowledge and understanding of the different lighting systems and tractions
3 -	Illustrate and describe theorems for solving electrical heating
4 -	Identify different electrical energy system applications and execution design methods and techniques for lighting, heating and traction systems

##### **b.Intellectual Skills: :**

1 -	Ability to define and analyze different lighting design problems
2 -	Compare, analyze and criticize different case studies, evaluate design alternatives and conclude results based on analytical thinking.
3 -	Decide and chose among different solution alternatives.

4 -	Evaluate obtained results both individually or as a part of team.
<b>c. Professional and Practical Skills: :</b>	
1 -	Ability to integrate knowledge and understanding of mathematics, science, information technology, design and engineering concepts to design and plan Electrical Lighting , traction Systems
2 -	Prepare working drawings n documents for design projects
3 -	Demonstrate project administration and management skills.
4 -	Use appropriate techniques for representation
<b>d. General and Transferable Skills: :</b>	
1 -	Write technical reports in accordance with standard scientific guidelines.
2 -	Work coherently and successfully as a part of a team in the Lab.
3 -	Analyze problems and use innovative thinking in their solution.

<b>Course Topic And Contents :</b>			
Topic	No. of hours	Lecture	Tutorial / Practical
Illumination: Artificial illumination requirements and characteristics	10	6	4
Types of lamps and luminaries	10	6	4
Electrical traction systems	15	9	6
Electric heating: Resistance wires, Electric furnaces, Dielectric heating	15	9	6
Electric welding of metals	5	3	2
Arc welding	5	3	2

<b>Teaching And Learning Methodologies :</b>
Lectures
Tutorials
E-Learning Program.
Laboratories.

<b>Course Assessment :</b>			
Methods of assessment	Relative weight %	Week No	Assess What
Final exam	40.00		to assess the performance of students during the course
o In Class Quizzes	20.00		
o Mid-Term exams	30.00		
o Participations	10.00		

<b>Course Notes :</b>
No course notes are required

<b>Recommended books :</b>

1. Utilization of electrical Energy and traction", J. B. Gupta and Rajeev Manglik S.K. Kataria & Sons, 2012.
2. Utilization of electrical Power and and Electric traction", J. B. Gupta.