

## 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	Abdelmonem Elsayy Abdelmonem Elsayy Khalil	2
Teaching Assistant	Mariam Mohamed Ali Ahmed Elshimey	

**Area Of Study :**

Upon successful completion of the course, the student should be able to:

1. know the different applications of Electrical energy.
2. develop the design of lighting schemes.
3. apply the modes of heat transfer in different mediums.
4. understand the traction systems.
5. Identify, formulate, and solve tractuin problems
6. understand the mportance of electric welding
7. Share ideas and work in a team or a 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, Induction 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 and

**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 in a self-directed manner.
3 -	Work coherently and successfully as a part of a team in the Lab.
4 -	Analyze problems and use innovative thinking in their solution.
5 -	Discuss conclusions and results of researches or assignments

### **Course Topic And Contents :**

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

### **Teaching And Learning Methodologies :**

Lectures
Tutorials
Laboratories

### **Course Assessment :**

Methods of assessment	Relative weight %	Week No	Assess What
Attendance	10.00		to assess the performance of students during the course
Final Exam	40.00	15	to assess the comprehensive understanding of the scientific background of the course, to assess the ability of problem solving with different techniques studied.
First Mid-Term Exam	15.00	7	to assess the skills of problem solving, understanding of related topics
Quizzes and Assignments (1)	10.00	5	to assess the skills of problem solving, understanding of related topics
Quizzes and Assignments (2)	10.00	9	to assess the skills of problem solving, understanding of related topics

Second Mid-Term Exam

15.00

11

to assess the skills of problem solving,  
understanding of related topics

**Course Notes :**

No course notes are required