

Engineering Program

Specialization	Electrical Installations and Equipment
Course Number	020304111
Course Title	Electrical power systems
Credit Hours	2
Theoretical Hours	2
Practical Hours	0

Brief Course Description:

- ❖ Power generation plants, transformation stations, high voltage network, electrical distribution systems and their faults.

Course Objectives:

The student should be able to Understand the generation , transmission, and distribution of electrical energy

Detailed Course Description:

Unit Number	Unit name	Unit Content	Time Needed
1.	Introduction	Active, reactive, apparent power. Power losses. Power factor	1 week
2.	Power generation plants	Types of power generation plants: 1. Steam power plants 2. Gaseous power plants 3. Diesel power plants 4. Hydraulic power plants 5. Renewable power plants	3 weeks
3	transformation stations	Power transformers, winding arrangement, cooling, tap changer. Main components	2 weeks
4	high voltage network	Insulation material, gas, liquid, solid. Electrical field and breakdown voltage	2 weeks
5	electrical distribution	Electrical substations, main components. Protection and control devices Current transformers Voltage transformers Bus bars	3 weeks
6	Faults in power systems.	Types of faults General protection	2 weeks
7	Transmission lines	Overhead transmission lines Equivalent circuits High voltage cables	2 weeks

□ **Evaluation Strategies:**

		Percentage	Date
1. Exams	Midterm Exam	40%	--/--/----
	Assignments	10%	
	Final Exam	50%	--/--/----

□ **Teaching Methodology:**

1. Lecture

□ **Textbook:**

Kirtley, James. Electric Power Principles: Sources, Conversion, Distribution and Use. Wiley, 2010. ISBN: 9780470686362.

References:

1. Electric Power Systems: A Conceptual Introduction by Alexandra von Meier

2. Power Generation, Operation, and Control by Allen J. Wood Hardcover