



# C.U.SHAH UNIVERSITY

**FACULTY OF:** Technology & Engineering  
**DEPARTMENT OF:** Electrical Engineering  
**BRANCH:** Electrical Engineering  
**SEMESTER:** VI  
**COURSE:** B.Tech  
**CODE:** 4TE06PSD1  
**NAME –** Power System Design and Simulation

---

## Teaching & Evaluation Scheme

Subject Code	Name of the Subject	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
4TE06PSD1	Power System Design and Simulation	0	0	2	2	1	--	--	--	--	--	50	50	100

### Objectives

1. To study various power system devices namely electrical transformer, transmission line and power conductor, two pole switch, isolator, earth switch, relays, and power transformer mathematical modelling of physical systems.
2. To study design and implementation of modelling circuits using Power switching components.
3. To study design and simulation of linear electromagnetics circuits using components

### Prerequisites

1. Basics and fundamental electro magnetics switchgear and protective circuits and analysis.

### Course Outlines

Sr. No.	Course Contents	Hours
1	<b>Transmission Line Design:</b> Overview of Electrical design of transmission line (Design philosophy, voltage level selection and choice of conductors, spacing of conductor and corona, insulators and SIL, design problem. Mechanical design of transmission line: Considerations, loading on conductors, span, sag and tension clearance, stringing, problems.)	04

2	<p><b>AC And DC Low Tension Distribution Design:</b></p> <p>Types of distribution systems: arrangements, selection and size of feeders using Kelvin's law, design of cables in distribution systems considering ampere capacity, voltage drop during starting and running load, primary distribution design, secondary distribution design.</p>	04
3	<p><b>Substation Design:</b> Determination of voltage regulation and losses in power system,</p> <p><b>Power System Earthing Power Station And Sub Station Earthing:</b></p> <p>Objectives, definitions, tolerable limits of body currents, soil resistivity, measurement of soil resistivity, earth resistance, measurement of earth resistance, tolerable step and touch voltage, actual step and touch voltage, design of earthing grid, impulse behavior of earthing system.</p>	06
4	<p><b>Design Of Power Station:</b> Introduction, selection of sizes and location of generating stations, interconnections issues with wind and Solar PV.</p> <p><b>Insulation Coordination And Location Of Lightning Arrestor:</b></p> <p>Introduction, definitions, insulation-co-ordination curves, determination of line insulation, Basic Insulation level (BIL), Insulation levels of substation equipments.</p>	02

### Learning Outcomes

After the completion of this course the students would be able to:

1. Design and implement various types 'distribution system.
2. Understand to various transmission lines and transmission devices.
3. To understand advance power system devices mathematical analysis.

### Books Recommended

1. M. V. Deshpande, Electrical Power System Design, TMH publication
2. B. R. Gupta, "Electrical Power System Design ", S. CHAND
3. Soni, Gupta and Bhatnagar, "A course in Electrical Power", Dhanpat Rai and Sons