Course Type	Course Code	Name of the Course	L	T	P	Credit
DE	NEED520	Electric Power Distribution Systems	3	0	0	3

Course Objectives:

The topics of the course focus on basic as well as advanced concepts related to Electric Power Distribution Systems. The objective of the course is to learn the various important concepts relevant to operation and analysis of electric power distribution systems. The course will enable learning of operation of various system components used in an electric power distribution system.

Learning Outcomes:

Upon successful completion of this course, students will acquire:

- in-depth knowledge on architecture and components of power distribution systems.
- in-depth knowledge on concepts relevant to operation and analysis of power distribution systems.
- an understanding of design of power distribution systems.
- an understanding of distribution system economics.

Unit No.	Topics to be covered	Lecture Hours	Learning Outcome
1.	*Distribution System Architecture and Components*: Introduction to distribution systems, layout of distribution systems, substation devices, compensating devices, transformers, regulators	L-7	Knowledge gain on distribution system architecture and the various components that are used in distribution systems.
2.	*Distribution System Analysis*: Distribution lines, models, voltage regulation, load duration curve, voltage drop and power loss calculations, effect of compensation, concepts of power quality for distribution systems	L-10	Knowledge gain on modelling and analysis of distribution systems.
3.	*Distribution System Planning and Design*: Load forecasting, substation design, primary and secondary system design, cold load pickup, grounding, overhead vs. underground system	L-9	Knowledge gain on design aspects of distribution systems.
4.	*Distribution System Operation*: Distribution automation, regulator operation, distribution system restoration, distribution system protection	L-10	Knowledge gain on distribution system automation, restoration, and protection.
5.	*Distribution System Reliability*: General reliability concepts, reliability indices, causes of outages	L-3	Knowledge gain on the concepts and measures of distribution system reliability.
6.	*Distribution System Economics*: Time value of money, interest, discount, annuity, economic evaluation	L-3	Knowledge gain on economics and economic evaluation of distribution system components.

Text Book:

1. Venkata S.S., and Pahwa A., Electric Power and Energy Distribution Systems: Models, Methods, and Applications, 1st Edition, Wiley-IEEE Press, 2023, ISBN: 9781119838258.

Reference Books:

1. Gönen T., Electric Power Distribution System Engineering, 2nd Edition, CRC Press, 2008, ISBN: 978-1-4200-6200-7.
2. Pabla A.S., Energy Power Distribution, 4th Edition, Tata McGraw-Hill Publishing Company Limited, 1997.
3. Burke J.J., Power Distribution Engineering: Fundamentals and Applications, 1st Edition, Marcel Dekker, Inc., 1994, ISBN: 0-8247-9237-8.

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