INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

ELECTRICAL POWER DISTRIBUTION SYSTEM								
I Semester: EPS								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
BPSE10	**Core**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	-	-	3	40	60	100
Contact Classes: 45	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 45**		
Prerequisite: Power System Analysis								

I. COURSE OVERVIEW:

Electric power distribution system plays an important role in the efficient operation of a modern industrial plant. Such a system includes high voltage circuit breakers, switchgear, transformers, motor control centers, electric motors, variable speed drive sheds' trouble-free electrical system is essential for an interruption-free plant operation. This course will cover all aspects of power distribution, including system planning, equipment selection and application, system grounding, protection and conformity with electrical code requirements, etc.

II. COURSES OBJECTIVES:

The students will try to learn

I. The application of SCADA in power distribution systems
II. The distribution management and distribution automation.
III. The Maintenance and AI techniques of automated distribution systems

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III. COURSE OUTCOMES:

After successful completion of the course, students will be able to:

CO1	Understand the importance of load forecasting in Distribution system to meet the future electrical load demands
CO2	Apply different types of power factor correction methods to increase the efficiency of the distribution system
CO3	Analyze communication systems, remote metering, automatic meter for collecting the data that's needed for billing purposes
CO4	Make use of SCADA in distribution automation to maintain efficiency, process data for smarter decisions
CO5	Examine placement of optimal switching devices for monitoring and to increase the efficiency of the distribution system
CO6	Apply AI techniques in electrical distribution system to enhance efficiency, reliability, and quality of electric service.

IV. COURSE CONTENT:

MODULE - I: IDISTRIBUTION OF POWER (09))

Distribution of power, management, power loads, load forecasting short-term and long-term, power system loading, technological forecasting

MODULE–II: ADVANTAGES OF DISTRIBUTION MANAGEMENT SYSTEM (09)

Advantages of distribution management system (D.M.S.): Distribution Automation, definition, restoration, reconfiguration of distribution network, different methods and constraints, power factor correction.

MODULE –III: INTERCONNECTION OF DISTRIBUTION (09)

Interconnection of distribution, control, communication systems, remote metering, automatic meter reading and its implementation; SCADA: Introduction, block diagram, SCADA applied to distribution automation.

Common Functions of SCADA: Advantages of distribution automation through SCADA.

MODULE –IV: OPTIMAL SWITCHING DEVICE PLACEMENT (08)

Calculation of optimum number of switches, capacitors, optimum switching device placement in radial, distribution systems, sectionalizing switches, types, benefits, bellman's optimality principle, remote terminal units, energy efficiency in electrical distribution, monitoring

MODULE –V: MAINTENANCE OF AUTOMATED DISTRIBUTION SYSTEMS (09)

Maintenance of automated distribution systems, difficulties in implementing distribution, automation in actual practice, urban, rural distribution, energy management, AI techniques applied to distribution automation.

TEXTBOOKS:

1. AS Pabla, "Electric Power Distribution", Tata McGraw Hill Publishing Co. Ltd., 4thEdition, 2012.
2. MK Khedkar, GMDhole, "A Text Book of Electrical power Distribution Automation", University Science Press, NewDelhi, 2ndEdition, 2010.

V. REFERENCE BOOKS:

1. Anthony J Panseni, "Electrical Distribution Engineering", CRCPress, 2nd Edition, 2010
2. James Momoh, "Electric Power Distribution, automation, protection & control", CRCPress 2nd Edition, 2006.

VI. ELECTRONICS RESOURCES:

1. NOC: Electrical Distribution System Analysis, IIT Roorkee
2. NOC: Power System Engineering, IIT Kharagpur

VII. MATERIALS ONLINE

1. Course template
2. Tutorial question bank
3. Tech-talk topics
4. Assignments
5. Model question paper-I
6. Model question paper-II
7. Lecture notes
8. Early learning readiness videos (ELRV)
9. Power point presentations