

Course Syllabi: UEE803 Load Dispatch and Communication (L : T : P :: 3 : 1 : 0)

1. **Course number and name:** UEE803; Load Dispatch and Communication

2. **Credits and contact hours:** Credits: 3.5; Hours: 4

3. **Text book, title, author, and year**

- *Carlson, A.B., Crilly; P.B., Rutledge, J.C., Communication Systems, McGraw–Hill ISE (2002).*
- *Chakraborti, A., Soni, M.L., Gupta, P.V. and Bhatnagar, U.S., a Text Book on Power System Engineering, DhanpatRai and Co. (P) Ltd. (2008).*
- *Nagrath, I.J. and Kothari, D.P., Modern Power System Analysis, Tata McGraw–Hill (2006).*
- *Pabla, A.S., Electric Power Distribution, Tata McGraw–Hill (2008).*
- *Wang, X., Modern Power System Planning, McGraw–Hill ISE (1994).*
- *Gupta, B.R., Power System Analysis and Design, S.Chand and Company Limited (2009).*
- *Wadhwa, C.L., Electrical Power Systems, New Age International (P) Limited, Publishers (2008).*

a. Other supplemental materials

- Nil

4. **Specific course information**

a. Brief description of the content of the course (catalog description)

Estimation of power system: Introduction, State estimation: Topology, Bad data handling, Observability analysis, Least square estimation, Steady state estimation of power systems, Tracking state estimation of power systems, Some computational considerations, External system equivalencing, Treatment of bad data, Network observability, Pseudo measurements.

States of power system: Introduction, Components of modern energy control center.

Load prediction: Estimation of average and trend terms, Periodic and stochastic components, Difference model forecasting.

Load dispatch centres: Introduction, functions, SLDC/RLDC, NLDC, Pre-dispatch, During-dispatch, Post dispatch functions. Supervisory control and data acquisition (SCADA) system RTU, Front end computers, Main computers, Visual display units, Mimic boards, Energy management System-functions.

System management: Introduction, Load management, Load shedding, Voltage/Frequency control, Reactive power management, Grid management, Operational co-operation, Import/Export of energy, Role of tariff in system operation, Maintenance, On-line maintenance, Grid disturbance/Case studies, Software tools.

Communication system: Introduction, Types-PLCC, Microwave, Leased lines, Fibre optics, Satellite, V-SAT, Communication comparison, Characteristics, Modules, Planning criteria, Selection criteria, RTUs, Modems, Baudrate, Communication protocols, Data exchange, System noise and interference, Integrated communication system.

5. **Specific goals for the course**

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

- Carry out state estimation and computational methods related to power system.
- Analyze various components of modern energy control centre.

- Carry out the prediction and forecasting related to load.
- Conduct studies related to various component of load dispatch centre.
- Decide the impact of system management.
- Decide the different modules for communication system.

6. **Brief list of topics to be covered**

- Estimation of power system
- States of power system
- Load prediction
- Load dispatch centres
- System management
- Communication system