

7th Semester	REL7D004	Flexible AC Transmission Systems	L-T-P 3-0-0	3 Credits
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- [5] Andres Carvallo, John Cooper, "The Advanced Smart Grid: Edge Power Driving Sustainability: 1", Artech House Publishers July 2011
- [6] Mladen Kezunovic, Mark G. Adamiak, Alexander P. Apostolov, Jeffrey George Gilbert "Substation Automation (Power Electronics and Power Systems)", Springer

Digital Learning Resources:

Course Name: Introduction to Smart Grid
 Course Link: <https://nptel.ac.in/courses/108/107/108107113/>
 Course Instructor: Prof. N.P. Padhy and Prof. Premalata Jena, IIT Roorkee

Module-I:

(14 hours)

FACTS concept and General System Considerations: Transmission Interconnections, Flow of Power in an AC System, what limits the Loading Capability, Power Flow and Dynamic Stability Considerations of a Transmission Interconnection, Relative Importance of Controllable Parameters, Basic Types of FACTS Controllers, Basic Description and Definitions of FACTS Controllers. Static Shunt Compensation: Objectives of Shunt Compensation, Methods of Controllable VAR Generation, Static VAR Compensators, SVC and STATCOM

Module-II:

(14 hours)

Static Series Compensators: Objective of Series Compensation (GCSC, TSSC, TCSC), Variable Impedance Type Series Compensators, Switching Converter Type Series Compensators (SSSC) Static Voltage and Phase Angle Regulators: Objectives of Voltage and Phase Angle Regulators, Approaches to Thyristor-Controlled Voltage and Phase Angle Regulators (TCVRs and TCPARs).

Module-III:

(8 hours)

Combined Compensators: Introduction, Unified Power Flow Controller (UPFC), The Interline Power Flow Controller (IPFC), Generalized and Multifunctional FACTS Controllers.

Books:

- [1] "Understanding FACTS: Concepts & Technology of Flexible AC Transmission Systems" By N.G. Hingorani & L. Gyugyi, IEEE Press, Standard Publishers Distributors, Delhi.
- [2] Facts Controllers in Power Transmission & Distribution by K.R. Padiyar, New Age International
- [3] Modelling & Simulation in Power Networks, Enrique Acha, Claudio Esquivel & H.A. Perez, CA Camcho, John Wiley & Sons.