REACTIVE POWER COMPENSATION AND MANAGEMENT

Course Code		Category	Hours / Week			Credits	Maximum Marks		
BPSC07 Contact Classes: 45		Elective Total Tutorials: Nil	L	Т	Р	С	CIA	SEE	Total
			3	0	0	3	30	70	100
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MODULE -I: LOAD COMPENSATION(09)

Objectives and specification: Reactive power characteristics, inductive and capacitive approximate biasing, load compensator as a voltage regulator, phase balancing and power factor correction of unsymmetrical loads examples.

MODULE –II: STEADYSTATE REACTIVE POWER COMPENSATION IN TRANSMISSION SYSTEM (09)

Uncompensated line: Types of compensation, passive shunt and series and dynamic shunt compensation, examples transient state reactive power compensation in transmission systems: Characteristic time periods, passive shunt compensation, static compensations, series capacitor compensation, compensation using synchronous condensers, examples.

MODULE -III: REACTIVE POWER COORDINATION (09)

Objective, mathematical modeling, operation planning, transmission benefits, basic concepts of quality of power supply, disturbances steady, state variations.

Effects of under voltages, frequency, harmonics, radio frequency and electromagnetic interferences.

MODULE -IV: DEMAND SIDE MANAGEMENT(09)

Load patterns, basic methods load shaping, power tariffs KVAR based tariffs penalties for voltage flickers and Harmonic voltage levels; Distribution side reactive power management: System losses, loss reduction methods, examples, reactive power planning, objectives, economics planning capacitor placement, retrofitting of capacitor banks.

MODULE -V: USER SIDE REACTIVE POWER MANAGEMENT(09)

Requirements for domestic appliances, purpose of using capacitors, selection of capacitors, deciding factors, types of available capacitor, characteristics and Limitations; Reactive power management in electric traction systems and are furnaces: Typical layout of traction systems, reactive power control requirements, distribution transformers, Electric arc furnaces, basic operations- furnaces transformer, filter requirements, remedial measures, power factor of an arc furnace.

V. Text Books:

- TJE Miller, "Reactive power control in Electric power systems", Wiely Publication, 1stEdition, 1982.
- 2. D MTagare, "Reactive power Management", by Tata McGraw Hill, 1st Edition, 2004. Science Press, New Delhi, 2ndEdition, 2010.

VI. Reference Books:

1. Wolfgang Hofmann, Jurgen Schlabbach, Wolfgang Just "Reactive Power Compensation: A Practical Guide", Wiely publication, 4thEdition, 2012.

VII. Web References:

- 1. http://www.academia.edu/9885014/SPECIAL_ELECTRICAL_MACHINES_NPTEL_NOTES
- 2. http://een.iust.ac.ir/profs/Arabkhabouri/Electrical%20Drives/Books/
- 3. https://ktu.edu.in/eu/att/attachments.htm?download=file&id=156232

II E-Text Books:

- 1. https://www.digital-library.theiet.org/content/books/po/pbpo022e
- 2. http://www.leeson.com/documents/PMAC_Whitepaper.pdf