

**UNIT 1 :** Over view of power Quality and quantity standards - IEC and IEEE definitions – voltage fluctuations-transients-unbalance-waveform distortion-power frequency variations.

**UNIT 2 :** Voltage variations, Voltage sags and short interruptions – flicker-longer duration variations - sources – range and impact on sensitive circuits-standards – solutions and mitigations – equipment and techniques.

**UNIT 3 :** Transients – origin and classifications – capacitor switching transient – lightning-load switching –impact on users – protection – mitigation.

**UNIT 4 :** Harmonics – sources – definitions & standards – impacts - calculation and simulation – harmonic power flow - mitigation and control techniques – filtering – passive and active.

**UNIT 5 :** Power Quality conditioners – shunt and series compensators-DStatcom-Dynamic voltage restorer-unified power quality conditioners-case studies.

**Text Books:**

1. Heydt, G.T., "Electric Power Quality", 2nd ed., Stars in a Circle Publications, Indiana,1994.
2. Bollen, M.H.J., "Understanding Power Quality Problems, Voltage sags and interruptions", IEEE Press, New York, 2000.
3. Arrillaga, J, Watson, N.R., Chen, S., "Power System Quality Assessment", Wiley, New York, 2000.