

## **PS5001 INDUSTRIAL POWER SYSTEM ANALYSIS AND DESIGN**

### DETAILED SYLLABUS

#### **OBJECTIVES**

To analyze the motor starting and power factor correction. □ To perform computer-aided harmonic and flicker analysis and to design filters. □ To expose various grid grounding methodologies

#### **UNIT I MOTOR STARTING STUDIES**

Introduction-Evaluation Criteria-Starting Methods-System Data-Voltage Drop Calculations-Calculation of Acceleration time-Motor Starting with Limited-Capacity Generators-Computer-Aided Analysis-Conclusions.

#### **UNIT II POWER FACTOR CORRECTION STUDIES**

Introduction-System Description and Modeling- Acceptance Criteria-Frequency Scan Analysis-Voltage Magnification Analysis-Sustained Over voltages- Switching Surge Analysis-Back-to-Back Switching-Summary and Conclusions.

#### **UNIT III HARMONIC ANALYSIS**

Harmonic Sources-System Response to Harmonics-System Model for Computer-Aided Analysis-Acceptance Criteria-Harmonic Filters-Harmonic Evaluation-Case Study-Summary and Conclusions.

#### **UNIT IV FLICKER ANALYSIS**

Sources of Flicker-Flicker Analysis-Flicker Criteria-Data for Flicker analysis- Case Study-Arc Furnace Load-Minimizing the Flicker Effects-Summary.

#### **UNIT V INSULATION AND COORDINATION**

Modeling of system; simulation of switching surges; description of EMTP – capabilities; voltage acceptance criteria; insulation coordination case study; methods of minimizing switching transients; conclusions.

#### **REFERENCES**

1. 1 Ramasamy Natarajan, "Computer-Aided Power System Analysis", Marcel Dekker Inc., 2002.
2. 2 EMTP literature from [www.microtran.cm](http://www.microtran.cm)
3. 3 IEEE papers on bus transfer.