

SAMRAT ASHOK TECHNOLOGICAL INSTITUTE, VIDISHA
(Engineering College)

Course Contents & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
M.E. Electrical III sem.	Power System Dynamics	MEPE-2231 (Elective-IV)	Min. "D"	Min. "D"	5.0

Topic Covered:

Unit-I

Introduction General basic concept of Power System Stability, States of operation & System Security, System Dynamics Problems, Review of Classical Model, System Model, Analysis of Steady State Stability & Transient Stability Modeling of Synchronous Machine Synchronous Machine, Park's Transformation, Analysis of Steady State Performance, P. U. Quantities, Equivalent Circuit of Synchronous Machine

Unit-II

Excitation systems & Prime Mover Controllers: Simplified Representation of Excitation Control, Excitation systems, Modeling, Std. Block Diagram, State Equations, Prime Mover Control System, Transmission Line & Load Modeling

Unit -III

Dynamics of Synchronous Generator Connected to Infinite Bus System Model, Synchronous Machine Model, System Simulation, Consideration of other Machine Models including SVC Model

Unit -IV

Small signal Stability -Single and multi-machine system, Damping and Synchronizing torque Analysis, Power System Stabilizers

Unit-V

Transient Stability and Voltage Stability Evaluation and Simulation, application of energy functions for direct stability evaluation, TS controllers. Voltage Stability: Introduction, affecting factors, analysis, comparison with angle stability

Text Book

Reference Books:

1. K. R. Padiyar, Power System Dynamics - Stability & Control, BS Publications
2. I.J. Nagrath and M. Gopal, Control system engineering, Wiley Eastern Ltd, 3rd edition, 2000.
3. Benjamin C. Kuo, Automatic Control system, Prentice Hall of India Pvt Ltd.
4. Prabha Kundur, Power System Stability and Control, Tata McGraw Hill

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Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
M.E. Electrical III sem.	Power Conditioning	MEPE-2232 (Elective-V)	Min. "D"	Min. "D"	5.0

Topic Covered:

Unit-I Power Quality:- Terms and definition general classes & power quality problems, Transients, short and long duration voltage variation, voltage in balance, power frequency variation, voltage sags and interruption estimate voltage sag performance, motor starting sag utility system fault clearing issue.

Unit-II Harmonics, power system quality under non sinusoidal condition, harmonic indices harmonic sources locating harmonic sources, system response characteristic effects of harmonic distortion, harmonic distortion evaluation, principles for controlling harmonics, harmonic studies, devices for controlling harmonic distortion, harmonic filter design.

Unit-III Transients over voltages, over voltage protection, over voltage protection devices utility capacitor switching transients, utility system lighting protection, managing ferro resonance, regulation of voltage, devices for voltage regulation, utility voltage regulation, capacitors for voltage regulation shunt capacitors, series capacitors. End user capacitor application.

Unit-IV Power quality Benchmarking:- Benchmarking process, RMS voltage variation indices, Harmonic indices, power quality contracts, power quality insurance, power quality state estimation including power quality in distribution planning. Distribution generation and power quality, reurgence of D.G.. interface to be utility system, power quality issue, operating conflicts, interconnection standard.

Unit-V Wiring and Grounding Grounding wiring and grounding problems, solution to wiring and grounding problems. Power quality Monitoring:- Monitoring considerations, power quality measurement equipments, Assessment of power quality measurement data, application of intelligent systems, power quality monitoring standards.

Text book

1) Electrical power systems quality by R-C Dugan, M F. Mcgranghan surya santoso, H wayne beaty, Tmh tub