

SHRI VENKATESHWARA UNIVERSITY



EVALUATION SCHEME & SYLLABUS

M.TECH Power System Part Time

(Two Years Post Graduation Programme)

II SEMESTER

(w.e.f. 2019-20)

**SCHOOL OF ENGINEERING &
TECHNOLOGY**

M.TECH
Power System
Part Time
SEMESTER-II

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	WPS-201	Power System Analysis	3	0	0	20	10	30		70		100	3
2	WPS-021	Electrical Power Distribution System	3	0	0	20	10	30		70		100	3
3	AUD-102	Disaster Management	3	0	0	20	10	30		70		100	
4	WPS-211	Power System Analysis LAB	0	0	4				25		25	50	2
		Total										350	08

Code	Course Name	L-T-P	Cr.
WPS -201	Power System Analysis	3-0-0	3

Course objective:

- Study various methods of load flow and their advantages and disadvantages
- Understand how to analyze various types of faults in power system
- Understand power system security concepts and study the methods to rank the contingencies
- Understand need of state estimation and study simple algorithms for state estimation
- Study voltage instability phenomenon

Unit No	Content
1	Load flow: Overview of Newton-Raphson, Gauss-Siedel fast decoupled methods, convergence properties, sparsity techniques, handling Qmax violations in constant matrix, inclusion in frequency effects AVR in load flow, handling of discrete variable in load flow.
2	Fault Analysis: Simultaneous faults, open conductors faults, generalized method of fault analysis
3	Security Analysis: Security state diagram, contingency analysis, generator shift distribution factors line outage distribution factor, multiple line outages, overload index ranking
4	Power System Equivalents: WARD REI. equivalents State Estimation : Sources of errors in measurement Virtual and Pseudo, Measurement, Observability, Tracking state estimation
5	WSL method, bad data correction
6	Voltage Stability : Voltage collapse, P-V curve, multiple power flow solution, Continuation power flow, optimal multiplies load flow, voltage collapse proximity indices.

Suggested reading:

- J.J. Grainger &W.D.Stevenson, “Power system analysis ”, McGraw Hill ,2003.

- R. Bergen & Vijay Vittal , “Power System Analysis” ,Pearson , 2000.
- L.P. Singh , “Advanced Power System Analysis and Dynamics”, New Age International, 2006.
- G.L. Kusic, “Computer aided power system analysis” ,Prentice Hall India, 1986
- A.J. Wood, “ Power generation, operation and control” , John Wiley, 1994
- P.M. Anderson, “Faulted power system analysis” , IEEE Press , 1995

Course outcomes : Students will be able to:

- Able to calculate voltage phasors at all buses, given the data using various methods of load flow.
- Able to calculate fault currents in each phase.
- Rank various contingencies according to their severity.
- Estimate the bus voltage phasors given various quantities viz. power flow, voltages, taps , CB status etc.
- Estimate closeness to voltage collapse and calculate PV curves using continuation power flow.

Code	Course Name	L-T-P	Cr.
WPS -211	Power System Steady State Analysis Lab	0-0-4	2

S. No.	Experiment
1	Power Systems & Power Electronics Lab
2	Computer Simulation Lab
3	Simulation of IGBT Inverters.
4	Simulation of Thyristor Converters.
5	Transient Stability Studies.
6	Short Circuit Studies.
7	Load Flow Studies
8	Load Forecasting and Unit Commitment

Code	Course Name	L-T-P	Cr.
WPS -021	Electrical Power Distribution System	3-0-0	3

Course Objectives:-Students will be able to:

- Learning about power distribution system
- Learning of SCADA System
- Understanding Distribution Automation

Unit No	Content
1	Distribution of Power, Management, Power Loads, Load Forecasting Short-term & Long-term, Power System Loading, Technological Forecasting
2	Advantages of Distribution Management System (D.M.S.), Distribution Automation: Definition, Restoration / Reconfiguration of Distribution Network, Different Methods and Constraints, Power Factor Correction
3	Interconnection of Distribution, Control & Communication Systems, Remote Metering, Automatic Meter Reading and its implementation
4	SCADA: Introduction, Block Diagram, SCADA Applied To Distribution Automation. Common Functions of SCADA, Advantages of Distribution Automation through SCADA
5	Calculation of Optimum Number of Switches, Capacitors, Optimum Switching Device Placement in Radial, Distribution Systems, Sectionalizing Switches – Types, Benefits, Bellman’s Optimality Principle, Remote Terminal Units, Energy efficiency in electrical distribution & Monitoring
6	Maintenance of Automated Distribution Systems Difficulties in Implementing Distribution. Automation in Actual Practice, Urban/Rural Distribution, Energy Management, AI techniques applied to Distribution Automation

Suggested reading

- A.S. Pabla, “ Electric Power Distribution”, Tata McGraw Hill Publishing Co. Ltd., Fourth Edition.
- M.K. Khedkar, G.M. Dhole, “A Text Book of Electrical power Distribution Automation”, University Science Press, New Delhi

- Anthony J Panseni, “Electrical Distribution Engineering”, CRC Press
- James Momoh, “Electric Power Distribution, automation, protection & control”, CRC Press

Course Outcomes :-Students will be able to:

- Knowledge of power distribution system
- Study of Distribution automation and its application in practice
- To learn SCADA system

Code	Course Name	L-T-P	Cr.
AUD -102	Disaster Management	2-0-0	0

Course Objectives: -Students will be able to:

learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.

Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives. Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.

Critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in.

Unit No.	Heading	Content
1	Introduction	Disaster: Definition, Factors And Significance; Difference Between Hazard And Disaster; Natural And Manmade Disasters: Difference, Nature, Types And Magnitude.
2	Repercussions Of Disasters And Hazards	Economic Damage, Loss Of Human And Animal Life, Destruction Of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts And Famines, Landslides And Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks And Spills, Outbreaks Of Disease And Epidemics, War And Conflicts.

3	Disaster Prone Areas In India	Study Of Seismic Zones; Areas Prone To Floods And Droughts, Landslides And Avalanches; Areas Prone To Cyclonic And Coastal Hazards With Special Reference To Tsunami; Post-Disaster Diseases And Epidemics
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4	Disaster Preparedness And Management	Preparedness: Monitoring Of Phenomena Triggering A Disaster Or Hazard; Evaluation Of Risk: Application Of Remote Sensing, Data From Meteorological And Other Agencies, Media Reports: Governmental And Community Preparedness.
5	Risk Assessment	Disaster Risk: Concept And Elements, Disaster Risk Reduction, Global And National Disaster Risk Situation. Techniques Of Risk Assessment, Global Co-Operation In Risk Assessment And Warning, People's Participation In Risk Assessment. Strategies for Survival
6	Disaster Mitigation	Meaning, Concept And Strategies Of Disaster Mitigation, Emerging Trends In Mitigation. Structural Mitigation And Non-Structural Mitigation, Programs Of Disaster Mitigation In India.

SUGGESTED READINGS:

R. Nishith, Singh AK, "Disaster Management in India: Perspectives, issues and strategies "New Royal book Company.

Sahni, Pardeep Et.Al. (Eds.), " Disaster Mitigation Experiences And Reflections", Prentice Hall Of India, New Delhi.

Goel S. L. , Disaster Administration And Management Text And Case Studies" ,Deep &Deep Publication Pvt. Ltd., New Delhi.

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