

SHRI VENKATESHWARA UNIVERSITY



EVALUATION SCHEME & SYLLABUS

M.TECH Power System Part Time

(Two Years Post Graduation Programme)

III SEMESTER

(w.e.f. 2019-20)

**SCHOOL OF ENGINEERING &
TECHNOLOGY**

M.TECH
Power System
Part Time
SEMESTER-III

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	WPS-301	Power System Dynamics-II	3	0	0	20	10	30		70		100	3
2	WPS-031	Restructured Power Systems	3	0	0	20	10	30		70		100	3
3	WLC-301	Research Methodology and IPR	2	0	0	20	10	30		70		100	2
	WPS-311	Power Quality LAB	0	0	4				25		25	50	2
		Total										350	10

Code	Course Name	L-T-P	Cr.
WPS -301	Power System Dynamics-II	3-0-0	3

Course Objectives:-Students will be able to:

- Study of power system dynamics

- Interpretation of power system dynamic phenomena
- Study of various forms of stability.

Unit No.	Content
1	Basic Concepts of Dynamic Systems and Stability Definition Small Signal Stability (Low Frequency Oscillations) of Unregulated and Regulated System
2	Effect of Damper, Flux Linkage Variation and AVR
3	Large Signal Rotor Angle Stability Dynamic Equivalents And Coherency Direct Method of Stability Assessment Stability Enhancing Techniques Mitigation Using Power System Stabilizer
4	Asynchronous Operation and Resynchronization Multi-Machine Stability
5	Dynamic Analysis of Voltage Stability Voltage Collapse
6	Frequency Stability Automatic Generation Control Primary and Secondary Control Sub-Synchronous Resonance and Counter Measures

Suggested reading:

- P. Kundur, "Power System Stability and Control", McGraw Hill Inc, 1994
- J. Machowski, Bialek, Bumby, "Power System Dynamics and Stability", John Wiley & Sons, 1997
- L. Leonard Grigsby (Ed.); "Power System Stability and Control", Second edition, CRC Press, 2007
- V. Ajarapu, "Computational Techniques for voltage stability assessment & control"; Springer, 2006.

Course Outcomes:- Students will be able to:

- Gain valuable insights into the phenomena of power system including obscure ones.

- Understand the power system stability problem.
- Analyze the stability problems and implement modern control strategies.
- Simulate small signal and large signal stability problems.

Code	Course Name	L-T-P	Cr.
MLC -101	Research Methodology and IPR	2-0-0	2

At the end of this course, students will be able to

- Understand research problem formulation.
- Analyze research related information
- Follow research ethics
- Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.
- Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.
- Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.

nit No.	Content
1	Meaning of research problem, Sources of research problem, Criteria Characteristics of a good research problem, Errors in selecting a research problem, Scope and objectives of research problem. Approaches of investigation of solutions for research problem, data collection, analysis, interpretation, Necessary instrumentations
2	Effective literature studies approaches, analysis, Plagiarism, Research ethics,
3	Effective technical writing, how to write report, Paper Developing a Research Proposal, Format of research proposal, a presentation and assessment by a review committee
4	Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting,

	development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.
5	Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and databases. Geographical Indications.
6	New Developments in IPR: Administration of Patent System. New developments in IPR; IPR of Biological Systems, Computer Software etc. Traditional knowledge Case Studies, IPR and IITs.

References:

- Stuart Melville and Wayne Goddard, "Research methodology: an introduction for science & engineering students"
- Wayne Goddard and Stuart Melville, "Research Methodology: An Introduction"
- Ranjit Kumar, 2nd Edition , "Research Methodology: A Step by Step Guide for beginners"
- Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd ,2007.
- Mayall , "Industrial Design", McGraw Hill, 1992.
- Niebel , "Product Design", McGraw Hill, 1974.
- Asimov , "Introduction to Design", Prentice Hall, 1962.
- Robert P. Merges, Peter S. Menell, Mark A. Lemley, " Intellectual Property in New Technological Age", 2016.
- T. Ramappa, "Intellectual Property Rights Under WTO", S. Chand, 2008

Code	Course Name	L-T-P	Cr.
WPS -311	Power Quality Lab	0-0-2	2

S.No.	Experiment
1	Introduction to Power System Protection
2	Impact of Induction Motor Starting on Power System
3	Modelling of Differential Relay using MATLAB
4	Radial Feeder Protection
5	Parallel Feeder Protection
6	Principle of Reverse Power Protection
7	Differential Protection of Transformer
8	To the study time vs. voltage characteristics of over voltage induction relay

ELECTIVE - III

Code	Course Name	L-T-P	Cr.
WPS-031	Restructured Power Systems	3-0-0	3

Course Objectives: -Students will be able to:

- Understand what is meant by restructuring of the electricity market
- Understand the need behind requirement for deregulation of the electricity market
- Understand the money, power & information flow in a deregulated power system

Unit No.	Content
1	Fundamentals of restructured system Market architecture Load elasticity Social welfare maximization
2	OPF: Role in vertically integrated systems and in restructured markets congestion management
3	Optimal bidding Risk assessment Hedging Transmission pricing Tracing of power
4	Ancillary services Standard market design Distributed generation in restructured markets
5	Developments in India IT applications in restructured markets
6	Working of restructured power systems PJM, Recent trends in Restructuring

Suggested reading:

- Lorrin Philipson, H. Lee Willis, "Understanding electric utilities and de-regulation", Marcel Dekker Pub. 1998.
- Steven Stoft, "Power system economics: designing markets for electricity", John Wiley and Sons, 2002.
- Kankar Bhattacharya, Jaap E. Daadler, Math H.J. Boolen, "Operation of restructured power systems", Kluwer Academic Pub., 2001.
- Mohammad Shahidehpour, Muwaffaq Alomoush, "Restructured electrical power systems: operation, trading and volatility", Marcel Dekker.

Course Outcomes: -Students will be able to:

- Describe various types of regulations in power systems.
- Identify the need of regulation and deregulation.
- Define and describe the Technical and Non-technical issues in Deregulated Power Industry.
- Identify and give examples of existing electricity markets.
- Classify different market mechanisms and summarize the role of various entities in the market
- machines.