

## About EEE Department

- 1) Department boasts of having very highly qualified faculty members from highly reputed institutions like IISc, IITs, NITs and richly experienced (ranging from 10-50 years) both from education & industrial fields.
- 2) Department encourages & supports faculty members to do research and consultancy projects.
- 3) All Labs are well equipped with latest softwares / machinery etc.
- 4) Department, apart from having excellent central library, has separate departmental library with books on state-of-art technology.
- 5) The institute has digital library where students & faculty can access on-line technical journals / magazines.
- 6) M.Tech. Class rooms equipped with LCD Projector, OHP.
- 7) Syllabus is latest & industry oriented.
- 8) M.Tech.(PSCA) is a very unique and specialized course on Power System Control & Automation available only at GVPCOE'
- 9) Every year 100% admission.
- 10) Department arranges expert lectures from field (2-3 per semester) for the benefit of the students.
- 11) Department has excellent results in the examinations both at the university level and at the institute level.
- 12) Outgoing students are very well placed in reputed organizations / institutions both abroad and in India.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD**

**M.Tech. (Power System Control and Automation)**

**W.E.F 2009 - 10**

**I Semester**

I Semester	Faculty Name	Qualification and Experience
1.Power System Operation AND Control	Sri H. Madhan Mohan Assistant Professor	M.Tech. (Power Systems) NIT Warangal 2 years
2.Advanced Power System Protection	Dr. K. Narasimha Rao Professor & HOD	Ph.D. (Power Systems) JNTU, HYD Teaching:13 Industry : 1
3. Microprocessors AND Microcontrollers	Sri G.V.E. Satish Kumar Associate Professor	M.Tech(NITD), Power Electronics & Drives Teaching: 7
4. High Voltage DC Transmission	Sri P. K. Das Associate Professor	M.Tech(NITW), Power Electronics & Drives Teaching: 8
5. Distribution Automation	Sri A.S.R.Sekhar Assistant Professor	M.Tech(AU), Power System Teaching:5
6. Elective – I (Digital Control Systems)	Smt. G. Chaitanaya Sudha Assistant Professor	M.E(AU),Control Systems Teaching:2
7. Power Systems Lab	Sri B. Viswanath / Sri A.S.R.Sekhar	Teaching: 18 Teaching:5

II Semester	Faculty Name	Qualification and Experience
1.Power Systems Control AND Stability	Sri KVSR Murthy Associate Professor	M.Tech(NITJ), Power System Teaching:11 Industry : 1
2. Flexible AC Transmission Systems	Sri G.V.E. Satish Kumar Associate Professor	M.Tech(NITD), Power Electronics & Drives Teaching: 7
3. Extra High Voltage Transmission	Sri B. Viswanath Associate Professor	M.Tech(IITD),Power System Teaching: 18 Industry: 7
4. Neural AND Fuzzy Systems	Smt. B. Aruna Kumar Assistant Professor i	M.E(A.U), Power System Teaching:1
5. Real Time Control of Power systems	Sri A.S.R.Sekhar Assistant Professor	M.Tech(AU), Power System Teaching:5
6. Elective – II (power Quality)	Dr. K. Narasimha Rao	Ph.D. (Power Systems) JNTU, HYD Teaching:13 Industry : 1
7. Electrical Systems Simulation Lab	Sri A.S.R.Sekhar	M.Tech(AU), Power System Teaching:5
	Smt. B. Aruna Kumar Assistant Professor	M.E(A.U), Power System Teaching:1
<b>III Semester</b>		
Seminar AND Project		
<b>IV Semester</b>		
Project		

**Department of Electrical and Electronics Engineering**

**RESULT ANALYSIS OF II SEM . M.TECH. (PSCA)2009 ADMITTED BATCH**

Date : 27-04-2010

BATCH NO:	:	2009 Adimitted Batch (2009-11)
BRANCH	:	EEE
YEAR	:	M.Tech (PSCA) – I Semester
RESULT DECLARED IN	:	September 2010
NO. OF CANDIDATES RESGISTERED	:	17
TOTAL NO OF STUDENTS PASSED	:	14
TOTAL NO.OF STUDENTS FAILED	:	03
OVER ALL PERCENTAGE PASS	:	82.35

Sl. No	Name of the Subject	No. of Students Passed	Pass %	Name of the faculty
1	Power System Operation AND Control	16	94.12	Prof. C.V.K. Bhanu
2	Advanced Power System Protection	15	88.26	Prof .K.Narasimha Rao
3	Microprocessors AND Microcontrollers	15	88.26	Sri G.V.E.Satish Kumar
4	High Voltage DC Transmission	17	100	Sri P.K. Das
5	Distribution Automation	17	100	Sri B. Viswanath
6	Elective – I (Digital Control Systems)	14	82.35	Smt. G.C. Sudha
7	Power Systems Lab	17	100%	Sri B. Viswanath Sri A.S.R. Sekhar Sri H. Madhan Mohan

**TOPPERS**

Register No	Name of the Candidate	Total (700)	%	Rank
09131D5309	PAVAN KUMAR PASUMARTHI	613	87.57	1
09131D5305	KAMESWARI K	580	82.86	2
09131D5304	JINCY T.V	567	81	3

Head of the Department

## Faculty Members Designation / Qualification / Experience / Date of Appointment

Sl. No.	Name of the Faculty	Designation	Qualifications	Experience in years	D.O.A
1	Dr. V. Ramamurthi	Sr. Professor	Ph. D (Moscow), Power System	Teaching: 42	19.05.1997
2	Dr. B. R. M.Gandhi	Sr. Professor	Ph. D(IT-BHU), Power System	Teaching: 42 Industry: 4	21.09.1998
3	Dr. V. Sitaramam	Sr. Professor	Ph. D(IIT-Roorke), Power System	Teaching: 42	08.01.2001
4	Dr. G. Govinda Rao	Sr. Professor	Ph. D(IISc), Power System	Teaching: 45 Industry: 1	08.01.2005
5	Dr. C. V. K. Bhanu	Professor	Ph. D(JNTU,H), Power System	Teaching : 11 Industry: 5	22.08.1997
6	Dr.K. Narasimha Rao	Professor & HOD	Ph. D(JNTU,H),Power System	Teaching:13 Industry : 1	21.01.2009
7	Sri B. Viswanath	Associate Professor	M.Tech(IITD),Power System	Teaching: 18 Industry: 7	01.08.2005
8	Sri P. K. Das	Associate Professor	M.Tech(NITW), Power Electronics & Drives	Teaching: 8	07.11.2001
9	Sri KVSR Murthy	Associate Professor	M.Tech(NITJ), Power System	Teaching:11 Industry : 1	16.06.2005
10	Sri G.V.E. Satish Kumar	Associate Professor	M.Tech(NITD), Power Electronics & Drives	Teaching: 7	26.08.2004
11	Sri T. S. Sirish	Associate Professor	M.Tech(NITC), Control systems (Ph.D. under progress)QIP	Teaching: 7	11.10.2004
12	Sri N.Satyanarayana	Assistant Professor	M.Tech(AU), Power Systems (Ph.D. under progress)	Teaching: 5	04.07.2005
13	Sri Vimlesh Verma	Assistant Professor	M.Tech (Nirma Inst.), Power Electronics & Drives (Ph.D. under progress)	Teaching: 3	07.06.2005
14	Sri D. Ramesh Kumar	Assistant Professor	B. Tech(AU)	Teaching: 5 Industry: 7	04.07.2005

15	Sri A Ravi Shankar	Assistant Professor	M.Tech(NITJ), Power Systems	Teaching: 5	21.02.2007
16	Sri A.S.R.Sekhar	Assistant Professor	M.Tech(AU), Power System	Teaching:5	30.06.2008
17	Sri G. Lakshmi Narayana	Assistant Professor	M.E(MSU, Baroda), Industrial Electronics	Teaching:3	18.07.2009
18	Sri P. Pawan Puthra	Assistant Professor	M.Tech(VIT), Power System	Teaching: `2	20.07.2009
19	Smt. G. Chaitanaya Sudha	Assistant Professor	M.E(AU),Control Systems	Teaching:2	24.07.2009
20	Sri H. Madhan Mohan	Assistant Professor	M.E(NIT Warangal),Power System	Teaching:2 Industry : 1	14.07.2009
21	Smt. B. Aruna Kumari	Assistant Professor	M.E(A.U), Power System	Teaching :1	25.02.2010
22	Mr. K. Ravi Kumar	Assistant Professor	M.Tech(JNTUK), Power System Control and Automation	Teaching: 6	22.06.2010
23	Mr. V. George Srugan	Assistant Professor	M.Tech(NITW), power System	Teaching: 1	22.06.2010
24	Mr. K. Sunil Kumar	Assistant Professor	M.Tech(NITC), Instrumentation & Control	Teaching: 1	31.08.2010

**Department of Electrical and Electronics Engineering**

**RESULT ANALYSIS OF II SEM . M.TECH. (PSCA)2009 ADMITTED BATCH**

Date : 21-09-2010

BATCH NO:	:	2009 Adimitted Batch (2009-11)
BRANCH	:	EEE
YEAR	:	M.Tech (PSCA) – II Semester
RESULT DECLARED IN	:	September 2010
NO. OF CANDIDATES RESGISTERED	:	17
TOTAL NO OF STUDENTS PASSED	:	16
TOTAL NO.OF STUDENTS FAILED	:	01
OVER ALL PERCENTAGE PASS	:	94.11

Sl. No	Name of the Subject	No. of Students Passed	Pass %	Name of the faculty
1	Power Systems Control and Stability	16	94.11%	Sri K.V.S.R.Murthy
2	Flexible AC Transmissi on Systems	17	100%	Sri G.V.E.Satish kumar
3	Extra High Voltage Transmission	16	94.11%	Sri B. Viswanath
4	Neural and Fuzzy Systems	17	100%	Smt.B.Aruna Kumari
5	Real Time Control of Power Systems	17	100%	Sri A.S.R. Sekhar
6	Power Quality	17	100%	Dr.K.Narasimha Rao
7	Electrical Systems Simulation Lab	17	100%	Sri A.S.R. Sekhar

**TOPPERS**

Register No	Name of the Candidate	Total (700)	%	Rank
09131D5305	Kameswari K	617	88.29%	1
09131D5309	Pavan Kumar Pasumarthi	615	87.86%	2
09131D5304	Jincy T.V	597	85.29%	3

Head of the Department

**GAYATHRI VIDHYA PARISHAD COLLEGE OF ENGINEERING  
MADHURAWADA, VISAKHAPATNAM-530041  
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**Faculty Members Specialization / Areas of Research Interests**

Sl.No	Name of the Faculty	Ph.d / M.Tech. Specialization	Areas of Research Interests
1	Dr. V. Ramamurthi	Ph.D. (Power Systems) from Moscow	Power System Stability & Dynamics
2.	Dr. V. Sitaramam	Ph.D. (Power System) IIT Roorkee	Power Systems Control Systems
3	Dr. G. Govinda Rao	Ph.D. (Power Systems) IISC, Bangalore	Power system Dynamics & Stability Power Quality Network Analysis & Synthesis
4	Dr. C.V.K. Bhanu	Ph.D. (Power Systems)	Risk Assessment Power Systems Operation , Protection, Neural Networks & Fuzzy Systems
5	Dr. K. Narasimha Rao	Ph.D. (Power Systems)	Power System Security Deregulation, Application of Neural Networks FACTS Devices.
6.	Sri B. Viswanath	M. Tech (Power Systems)	Power System Economic Operation, Distribution Systems and Automation, Power Transmission, Artificial Intelligence Application to Power Systems.
7	Sri P.K. Das	M.Tech (Power Electronics & Drives)	Power Electronics Industrial Drives
8	Sri K.V.S.R.Murthy	M. Tech (Power Systems)	Distribution Systems Stability Fuzzy P S O Genetoc Algorithm

9	Sri G.V.E.Satish kumar	Industrial Electrical Systems	Power Electronics FACTS
10	Sri D. Ramesh Kumar	B.Tech.	Microprocessors
11	Sri A. Ravi Shankar	M. Tech (Power Systems)	Modeling of Em/c Power System Protection
12	Sri A.S.R. Sekhar	M.E. (Power Systems and Automation)	Distribution Systems Battery Energy Storage Systems Wind Power Generation
13	Sri G. Lakshminarayana	M.E. (Industrial Electronics)	Embedded Systems related to Power Electronics Applications, Power Electronics Drives
14	Sri Pawan puthra Pappu	M. Tech (Power Electronics & Devices)	Non Conventional Energy Source Exploting with Facts Devices
15	Smt. G. C. Sudha	M.Tech (Control Systems)	Control Systems
16	Sri H. Madhan Mohan	M. Tech (Power Systems)	Power Systems
17	Smt. Aruna Kumari	M.E. Power Systems	Power Electronics & Drives Power Systems
18	Sri K. Ravi Kumar	M. Tech. (Power Systems Control & Automation)	Economic Dispatch, Power Quality Distribution System PSO GA
19	Sri George Srujan	M.Tech (Power Systems Engineering)	Dispersed Generation Distribution Systems Load Flows
20	Sri V. Sunil Kumar	M.Tech. (Instrumentation & Control Systems)	Model Predictive Control Distributed Control Systems PLC's Automation

**GAYATHRI VIDHYA PARISHAD COLLEGE OF ENGINEERING  
MADHURAWADA, VISAKHAPATNAM-530041  
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**List of M.TECH.(PSCA) PROJECT WORKS BATCH-I (2004 to 2009) Admitted Batch**

**DR. C.V.K. BHANU**

SL.No	Reg. No	Name of the Student	Project Topic	Designation/ Qualification Experience	Status	No. of Publications
01	05131D5307	N V PADMAVATHI ANUPAMA	Transient Stability Enhancement of UPFC using Particle Swarm Optimization	Teaching : 11 Industry: 5	DRC Not Completed	03
02	06131D5301	BONGU RAMESH	Supplier Risk Analysis in the Day Ahead Electricity Market	Prof. C. V. K..Bhanu Professor, GVPCOE.		
03	07131D5310	Mula SNRJS Kumar	Novel Control Strategy using shunt active filter 2. Unity Power Factor Correction using Boost Regulator - 3 Phase Application 3. Power system Modelling	Prof. C. V. K..Bhanu Professor, GVPCOE Teaching : 11 Industry: 5		
04	07131D5317	Vinod Kumar Athotha	Power System Modeling 2. Stability Analysis of HVDC system 3. Economic Load Dispatch	Prof. C. V. K..Bhanu Professor, GVPCOE. Teaching : 11 Industry: 5		
05	<b>08131D5306</b>	<b>Lalitha Kumari Saladi</b>	1.Voltage Stability	Prof. C. V. K..Bhanu Professor, GVPCOE. Teaching : 11 Industry: 5,		
06	<b>08131D5313</b>	<b>Ranadheer Inteti</b>	2.Battery Energy Storage Systems	Prof. C. V. K..Bhanu Professor, GVPCOE. Teaching : 11 Industry: 5		

**Dr. K. NARASIMHA RAO**

SL.No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	07131D5309	K. Maheswara Rao	Available Transfer Capability (ATC)	Prof. K. Narasimha Rao Professor, EEED, GVPCOE. Teaching:13 Industry : 1	PRC Completed	09
02	09131D5304	Jincy T.V.	1. Load Flows	Dr.K. Narasimha Rao Teaching:13 Industry : 1		

**SRI B. VISWANATH**

SL.No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	04131D5305	G.Vijay Sekhar	Improved Model of Unified Power Flow Controller (UPFC) and Simulation Using Matlab / Simulink	Sri B.Viswanath Associate Professor , EEED, GVPCOE. Teaching: 18 Industry: 7	Distinction	
02	04131D5308	S.Surendra Kumar	State Space Modeling of Unified Power Quality Conditioner for Power Quality Improvement	Sri B.Viswanath Associate Professor , EEED, GVPCOE. Teaching: 18 Industry: 7	Distinction	
03	05131D5303	GURUGUBELLI RAMAKRISHNA	Data Acquisition and Transmission System for on Line Monitoring of Transformer	Sri B. Viswanath, Associate Professor , EEED, GVPCOE Teaching: 18 Industry: 7	Completed	
04	05131D5309	S V V BHASKAR	Optimal Power Flow by Enhanced Genetic Algorithm	Sr. B. Viswanath Associate Professor , EEED, GVPCOE. Teaching: 18 Industry: 7	DRC Completed	

05	06131D5307	SAROJA KAMESWARI NORI	Design and Testing of Continually Online Trained (COT) Artificial Neural Network (ANN) Based Controller for excitation Control of Generator (In Indian Context)	Sri. B. Viswanath Assos. Prof. , EEED, GVPCOE Teaching: 18 Industry: 7	First Class	
06	07131D5315	V Raja Kumar	Network Reconfiguration in Distribution Systems using Soft - Computing Techniques (GA, FNN, etc.,)	Sri. B. Viswanath Assos. Prof. , EEED, GVPCOE Teaching: 18 Industry: 7	Completed	
07	07131D5316	Vijaya Lakshmi ASV	New Approach with a Hopfield Modeling framework to Economic Dispatch	Sri. B. Viswanath Assos. Prof. , EEED, GVPCOE Teaching: 18 Industry: 7	PRC Completed	
08	<b>08131D5316</b>	<b>Sushmitha Kappala</b>	1.HVDC Transmission System – Problems and Solutions using modern techniques	Sri. B. Viswanath Assos. Prof. , EEED, GVPCOE Teaching: 18 Industry: 7		
09	<b>08131D5309</b>	<b>Nandigam Ashwinee Krishna</b>	1. Application of Soft-Computing Techniques to Emission/Economic Load Dispatch	Sri. B. Viswanath Assos. Prof. , EEED, GVPCOE Teaching: 18 Industry: 7		
10	09131D5315	Siddabathula Vamsi Krishna	2. Distribution Systems	Sri. B. Viswanath Assos. Prof. , EEED, GVPCOE Teaching: 18 Industry: 7		

**SRI P.K.DAS**

SL.No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	04131D5301	A.Raja Shekar Naidu	Modeling of Thyristor Controlled Series Capacitor (TCSC) and Simulation Using Matlab /Simulink	Sri P.K.Das, Associate Professor , EEED, GVPCOE. Teaching: 8	FIRST CLASS	07
07	04131D5307	S.Venu Gopal Reddy	Modeling and Application of Static Synchronous Series Compensator (SSSC)	Sri P.K.Das Associate Professor , EEED, GVPCOE. Teaching: 8	FIRST CLASS	
03	05131D5301	ARUNA KUMARI PONNADA	Modeling Analysis of FACTS Devices for Power Flow Studies	Sri P.K.Das Associate Professor , EEED, GVPCOE Teaching: 8	Completed	
04	06131D5305	KINTALI MANOHAR	High Speed Identification of Faults in HVDC Line using Wavelet Technique.	Sri P.K.Das Assos. Prof. , EEED, GVPCOE Teaching: 8	Completed	
05	07131D5306	Hema Kumar Doddi	Unity Power Factor Correction using Boost Regulator - 3 Phase Application	Sri P.K.Das Assos. Prof. , EEED, GVPCOE Teaching: 8		
06	07131D5314	Upendra Kumar Potnuru	Multilevel Inverters using Space Vector Pulse Width Modulation Techniques	Sri P.K.Das Assos. Prof. , EEED, GVPCOE Teaching: 8		
07	<b>08131D5315</b>	<b>Rupavathi Yellai</b>	. HVDC Transmission	. Sri P.K.Das Assos. Prof. , EEED, GVPCOE Teaching: 8		

08	09131D5316	Srikanth Balla	Design and Simulation of Harmonic Filters - Active Fillers	Sri P.K.Das Assos. Prof. , EEED, GVPCOE Teaching: 8		
----	------------	----------------	--	---	--	--

**SRI K.V.S.R. MURTY**

SL.No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	04131D5309	T.Srinivas Kishore	Comparision of Methods for Determining Proximity to Static Voltage Collapase	Sri K.V.S.R. Murthy Associate Professor , EEED, GVPCOE. Teaching:11 Industry : 1	Distinction	06
02	04131D5311	V.V.Krishna Kanth	Improvement of Power Quality In Power Systems Subjected to Harmonic Pollution From Adjustable Speed Dives	Sri K.V.S.R. Murthy Associate Professor , EEED, GVPCOE. Teaching:11 Industry : 1	FIRST CLASS	
03	05131D5302	DABBIRU RAMAKRISHNA	Application of Artificial Neural Networks In Transient Stability Studies	Sri K.V.S.R. Murthy Associate Professor , EEED, GVPCOE Teaching:11 Industry : 1	Distinction	
05	05131D5305	MADHUSUDHANA RAO. N	Optimal Location of Capacitor on Distribution System using Fuzzy Expert	Mr. K.V.S.R. Murthy Associate Professor , EEED, GVPCOE	DRC Not Completed	
06	06131D5304	KATIKANDLA PRAGNA SWAROOP	An Improved Method for Service Restoration in Power Distribution Systems	Sri K.V.S.R. Murthy Assos. Prof. , EEED, GVPCOE Teaching:11 Industry : 1	Completed	
07	07131D5305	Erlu Venkata Vara Prasad	Electrical Energy Consumption in Agriculture Sector	Sri K.V.S.R. Murthy Assos. Prof. , EEED, GVPCOE Teaching:11 Industry : 1		

08	09131D5309	Pavan Kumar Pasumarthi	Power System Stability Studies	Sri K.V.S.R. Murthy Assos. Prof. , EEED, GVPCOE Teaching:11 Industry : 1		
09	09131D5308	Madhu Babu Paila	Distribution Systems	Sri K.V.S.R. Murthy Assos. Prof. , EEED, GVPCOE Teaching:11 Industry : 1		

**SRI RAMA SASTRY**

SL.No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	06131D5309	VENKATA SURESH KUMAR .M	The Robust Load-Frequency controller design for power systems	Mr. C. Rama Sastry Assos. Prof. , EEED, GVPCOE	PRC Over	

**SRI G.V.E.SATISH KUMAR**

SL.No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	05131D5308	RAVI KUMAR KENUGUVA	Soft Computing Techniques Based Economic Dispatch In Power Systems	Sri .G.V.E.Satishkumar Assistant Professor , EEED, GVPCOE Teaching: 7	Distinction	01
02	06131D5302	D. RAMESH KUMAR	Design and Implementation of Thyristor Controlled Series Capacitor (TCSC) for Power Flow Control in a Long Transmission Line	Sri. G.V.E. Satish Kumar Assist. Prof. , EEED, GVPCOE Teaching: 7		
03	07131D5311	Naresh Babu Peyyala	Unity Power Factor Correction using Boost Regulator - 3 Phase Application 2. Multilevel Inverters using Space Vector Pulse Width Modulation Techniques 3. Power Quality	Mr. G.V.E. Satish Kumar Assos. Prof. , EEED, GVPCOE Teaching: 7		
04	07131D5312	Prakash TNDVS	Unit Commitment - Different Optimization Methods Including All the Constraints	Mr. G.V.E. Satish Kumar Assos. Prof. , EEED, GVPCOE Teaching: 7		
05	<b>08131D5303</b>	<b>K. Rajasekhar</b>	.Modeling of Static Synchronous Series	Mr. G.V.E. Satish Kumar		

		<b>Chowdary</b>	Compensator in Power System	Assos. Prof. , EEED, GVPCOE Teaching: 7		
06	<b>08131D5308</b>	<b>Murali Krishna Velamala</b>	Compensation of Transmission Lines	Mr. G.V.E. Satish Kumar Assos. Prof. , EEED, GVPCOE Teaching: 7		
07	09131D5307	Mabushuvan Kiladi	Multilevel Inverter – Grid Connection	Mr. G.V.E. Satish Kumar Assos. Prof. , EEED, GVPCOE Teaching: 7		
08	09131D5318	V. V. Ramana Guptaji B	Power System Protection	Mr. G.V.E. Satish Kumar Assos. Prof. , EEED, GVPCOE Teaching: 7		

### SRI T.S. SIRISH

SL.No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	04131D5303	Ch.Durga Prasad	Mitigation of Voltage Sags and Swells Using a Series Active Power Filter	Sri T.S.Sirish Assistant Professor , EEED, GVPCOE Teaching : 7	Second Class	02
02	04131D5304	Ch.Naga Sekhar	Modeling of Vector Control Induction Motor Using Matlab	Sri T.S.Sirish Assistant Professor , EEED, GVPCOE Teaching : 7	FIRST CLASS	
03	04131D5310	Ms. U.Salma	Stability Analysis of Large Power System Components	Sri T.S.Sirish Assistant Professor , EEED, GVPCOE Teaching : 7	FIRST CLASS	
04	05131D5304	KRANTI KIRAN ANKAM	Design of STATCOM for a specific Power System and Case Study.	Sri T.S.Sirish Assistant Professor , EEED, GVPCOE Teaching : 7	Completed	
05	06131D5306	K KIRAN KUMAR	System Identification by Genetic Algorithm	Sri T.S.Sirish Assistant Professor , EEED, GVPCOE Teaching : 7		
06	07131D5301	Badireddy Sankuntala	Analysis of Custom Power System 2. Voltage Sag Compensation 3. Frequency	Sri T.S.Sirish Assistant Professor , EEED,		

			Response of TCSC	GVPCOE Teaching : 7		
--	--	--	------------------	------------------------	--	--

**SRI N. SATYANARAYANA**

SL.No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	04131D5302	Ms. B.B.Malleswari	Analytical Study on Control Range of Static Var Compensators	Sri N.Satyanarayana Assistant Professor , EEED, GVPCOE Teaching : 5	Distinction	02
02	04131D5306	J.Shyam Sundar	Reactive Power Control In a Distribution Network By Using Static Synchronous Compensator	Sri N.Satyanarayana Assistant Professor , EEED, GVPCOE Teaching : 5	FIRST CLASS	
03	06131D5308	SURENDRANATH CHOUDARY VADLAMUDI	Harmonic Power Flow Analysis for Industrial Power Distribution System	Mr. N.Satyanarayana Assist. Prof. , EEED, GVPCOE Teaching : 5	Completed	

**SRI D. RAMESH KUMAR**

**SRI VIMLESH VERMA**

SL.No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	05131D5306	MENDA EBRAHEEM	Enhancement of ATC (Available Transfer Capability) Calculation Through Reactive Power Flows	Sri. Vimlesh Verma Assistant Professor , EEED, GVPCOE Teaching: 3	Completed	03
02	07131D5302	Boniseetti Giridhar Rao	PMBLDC Motor Drive 1.Analysis and Design of FCTCR and DVR mitigating voltage dips/swells	Sri. Vimlesh Verma Assistant Professor , EEED, GVPCOE Teaching: 3		
03	07131D5307	K. Naveen Kumar	Vector Control Induction Motor Drive	Sri. Vimlesh Verma Assistant Professor , EEED, GVPCOE Teaching: 3		

**SRI A. RAVI SHANKAR**

SL.No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	06131D5303	D SAI PRASANTH	Effect of Mutual Coupling of Parallel Lines on setting of Distance Relay	Sri. A. Ravi Shankar Assist. Prof. , EEED, GVPCOE Teaching: 5	Completed	
02	07131D5308	Kusuma Pradeep	Transient Stability Studies on Multi Bus System	Sri. A. Ravi Shankar Assist. Prof. , EEED, GVPCOE Teaching: 5		
03	09131D5305	Kameswari Kandula	Power System Stability Studies	Sri. A. Ravi Shankar Assist. Prof. , EEED, GVPCOE Teaching: 5		
04	09131D5313	Seelam Swarupa	Power System protection	Sri. A. Ravi Shankar Assist. Prof. , EEED, GVPCOE Teaching: 5		

**SRI A.S.R. SEKHAR**

SL.No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	07131D5303	Boyi Venkata Ramana	Recent Optimization Approaches for OPF with consideration of FACTS Devices	Mr.ASR Sekhar Assist. Prof. EEED, GVPCOE Teaching:5		
02	07131D5313	Tedlapu Ramesh Babu	Reduction of Losses and saving operational using classical and modern optimization Techniques	Mr.ASR Sekhar Assist. Prof. EEED, GVPCOE Teaching:5		
03	<b>08131D5305</b>	<b>Kusal Kumar Kovelakonda</b>	Battery Energy Storage Systems	Mr.ASR Sekhar Assist. Prof. EEED, GVPCOE Teaching:5		
04	09131D5302	Dharani Komala Rao Matangi	Wind Power Generation	Mr.ASR Sekhar Assist Prof. EEED, GVPCOE Teaching:5		

**SRI KRISHNA MOHAN**

SL.No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	07131D5304	Chaitanya Vysa Raju	Methods of Improving voltage Stability using FACTS Devices	Mr. M. Krishna Mohan Assist Prof. EEED, GVPCOE Teaching:2		

**SRI G. LAKSHMI NARAYANA**

Sl. No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	<b>08131D5314</b>	<b>Ravi Kumar Bodda</b>	Power Electronics Applications in Power Systems	Sh. G. Lakshmi Narayana, Assist Professor  Teaching:3		

02	09131D5317	Varaprasad K. S. B.	HVDC Transmission	Sh. G. Lakshmi Narayana, <b>Assist Professor</b> <b>Teaching:3</b>		

**SRI PAWAN PUTHRA PAPPU**

Sl. No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	<b>08131D5317</b>	<b>Tadimeti Ganesh Kumar</b>	Switched Mode Power Supplies (SMPS)	Sh. Pawan Puthra Pappu <b>Assist Professor</b> <b>Teaching:3</b>		
02	09131D5312	Ravi Kumar Pappu	FACTS Applications	Sh. Pawan Puthra Pappu <b>Assist Professor</b> <b>Teaching:3</b>		

**SMT. G.C. SUDHA**

Sl. No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	<b>08131D5307</b>	<b>Manofarali Gadedamalla</b>	Control Systems	Smt. G. Chaitanya Sudha, <b>Assist Professor</b> <b>Teaching:3</b>		
02	09131D5301	Ammanabrolu Venkata Rajesh	Power System Stability Studies	Smt. G. Chaitanya Sudha <b>Assist Professor</b> <b>Teaching:3</b>		

**SRI H. MADHAN MOHAN**

Sl. No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	07131D5303	Boyi Venkata Ramana	Recent Optimization Approaches for OPF with consideration of FACTS Devices	Sh. H. Madan Mohan <b>Assist Professor</b> Teaching:2		
02	<b>08131D5302</b>	<b>Gorli Kamesh</b>	. Improving of Power Capability by AC/ DC Transmission	Sh. H. Madan Mohan <b>Assist Professor</b> Teaching:2		
03	09131D5314	Shefali Apoorva	Power Systems Protection	Sh. H. Madan Mohan <b>Assist Professor</b> Teaching:2		

**SMT. ARUNA KUMARI**

Sl. No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
01	07131D5303	Boyi Venkata Ramana	Recent Optimization Approaches for OPF with consideration of FACTS Devices	Smt. B. Aruna Kumari <b>Assist Professor</b> Teaching:1		
02	09131D5306	Komali Veeranki	Application of A.I. to Power Systems	Smt. B. Aruna Kumari <b>Assist Professor</b> Teaching:1		

**SRI K. RAVI KUMAR**

Sl. No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
1	09131D5310	Pydiraju Chintapalli	Optimal Power Flow	Sh. K. Ravi Kumar		

**SRI GERORGE SRUZAN**

Sl. No	Reg. No	Name of the Student	Project Topic	Internal Guide / Experience	Status	No. of Publications
1	09131D5303	Durga Malleswara Rao K.	1. Fuzzy Logic Application to Power System	Mr. V. G. Srujan		

**ACADEMIC REGULATIONS  
COURSE STRUCTURE  
AND  
DETAILED SYLLABUS**

**M.Tech.  
Power System Control and Automation**

(Effective for the students admitted from the academic year 2005-06)



**Jawaharlal Nehru Technological University  
Hyderabad - 500 072**

**II Semester**

**COURSE STRUCTURE AND SYLLABUS**

Name of the Subjects	Hrs/Week	
	Lecture	Practical
<b>I Semester</b>		
1.Power System Operation AND Control	4	-
2.Advanced Power System Protection	4	-
3. Microprocessors AND Microcontrollers	4	-
4. High Voltage DC Transmission	4	-
5. Distribution Automation	4	-
6. Elective – I	4	-
7. Power Systems Lab	-	3
<b>II Semester</b>		
1.Power Systems Control AND Stability	4	-
2. Flexible AC Transmission Systems	4	-
3. Extra High Voltage Transmission	4	-
4. Neural AND Fuzzy Systems	4	-
5. Real Time Control of Power systems	4	-
6. Elective – II	4	-
7. Electrical Systems Simulation Lab	-	3
<b>III Semester</b>		
Seminar AND Project	-	-
<b>IV Semester</b>		
Project	-	-

**Elective I :**      1. Advanced Digital Signal Processing  
                          2. Digital Control Systems  
                          3. Power System Reliability

**Elective – II :**    1.Operation Research  
                          2. Embedded systems  
                          3. Power Quality

**I- Semester**

**POWER SYSTEM OPERATION AND CONTROL**

**Unit 1 :** Unit commitment problem : Introductions to UCP, thermal AND Hydral constraints in Unit commitment : Priority list scheme method, unit commitment problem solution by priority list scheme method,

**Unit 2 :** Unit commitment problem solutions by Dynamic programming Approach. Introduction, advantages of DP method over priority list scheme, Back word DP approach, forward DP approach algorithm and their flow charts solution UCP using Dynamic program method.

**Unit 3 :** Load Frequency Control-I : Necessity of keeping frequency constant. Definition of control area, single area control, Block diagram representation of an isolated Power System, Steady State analysis, Dynamic response-Uncontrolled case.

**Unit 4 :** Proportional plus Integral control of single area and its block diagram representation, steady state response, load frequency control and Economic dispatch control.

**Unit 5 :** Load Frequency Control-II : Load frequency control of 2-area system : uncontrolled case and controlled case, tie-time bias control.

**Unit 6 :** Optimal LF control-steady state representation, performance Index and optimal parameter adjustment.

**Unit 7 :** Generation with limited Energy supply : Take-or-pay fuel supply contract, composite generation production cost function. Solution by gradient search techniques, Hard limits and slack variables, Fuel scheduling by linear programming.

**Unit 8 :** Interchange Evaluation and Power Pools Economy Interchange, Economy interchange Evaluation, Interchange Evaluation with unit commitment, Multiple Interchange contracts. After-the-fact production costing, Transmission Losses in transaction Evaluation, other types of Interchange, power pools.

**Reference Books :**

1. Power Generation, Operation and Control - by A.J.Wood and B.F.Wollenberg, John wiley & sons Inc. 1984.
2. Electrical Energy Systems Theory - by O.I.Elgerd, Tata Mc Graw-Hill Publishing Company Ltd, 2<sup>nd</sup> edition.
- 3.Modern Power System Analysis - by I.J.Nagrath & D.P.Kothari, Tata Mc Graw-Hill Publishing Company ltd, 2<sup>nd</sup> edition.

**I- Semester**

**ADVANCED POWER SYSTEM PROTECTION**

**Unit 1:**

Primary and back up protection, current transformers for protection, potential transformer, review of electromagnetic relays static relays.

**Unit 2:**

Over current relays time current characteristic, current setting time setting, directional relay, static over current relays.

**Unit 3:**

Distance protection : impedance, reactance, mho, angle impedance relays. Input quantities for various types of distance relays, effect of arc resistance on the performance of distance relays, selection of distance relays. MHO relay with blinders, quadrilateral relay, elliptical relay. Restricted mho, impedance directional, reactance relays. Swiveling characteristics.

**Unit 4:**

Compensation for correct distance measurement, reduction of measuring units switched schemes. Pilot relaying schemes. Wire pilot protection, circulating current scheme, balanced voltage scheme, transley scheme , carrier current protection, phase comparison carrier current protection, carrier aided distance protection.

**Unit 5:**

Digital relaying algorithms, differential equation technique, discrete fourier transform technique, walsh-hadamard transform technique, rationalized harr transform technique, removal of dc offset

**Unit 6:**

Introduction to Microprocessors: review of microprocessors and interfacing. single chip microcomputers programmable interval timer, A/D converter.

**Unit 7:**

Microprocessor based protective relays: over current, directional, impedance, reactance relays. Generalized mathematical expressions for distance relays, mho and offset mho relays, quadrilateral relay.

**Unit 8:**

Microprocessor implementation of digital distance relaying algorithms.

**Text book**

1. Power system protection & switchgear by Badri ram & vishwakarma, TMH publication New Delhi 1995.
2. Power System Protection by Madhava Rao TMH

**Reference Books**

1. Power System by Ravindra Nath and Chandar PHI.

## I- Semester

### MICROPROCESSORS AND MICROCONTROLLERS

**Unit 1: 8086/8088 processors** : Introduction to 8086 Microprocessors, Architecture, Addressing modes, Instruction set, Register Organization, Assembler directives.

**Unit 2: Hard ware description:** Timing diagram signal description min & max modes, bus timing, ready & wait states, 8086 based micro computing system.

**Unit 3: Special features AND Related Programming** : Stack structure of 8086, Memory segmentation, Interrupts, ISR, NMI, MI and interrupt Programming, Macros.

**Unit 4: Advanced Microprocessors:** Intel 80386 programming model, memory paging, Introduction to 80486, Introduction to Pentium Microprocessors and special Pentium pro features.

**Unit 5 :-Basic peripherals AND Their Interfacing:-**Memory Interfacing (DRAM) PPI- Modes of operation of 8255, Interfacing to ADC AND DAC.

**Unit 6:- Special Purpose of Programmable Peripheral Devices and Their interfacing :-** Programmable interval timer, 8253, PIC 8259A, display controller Programmable communication Interface 8251, USART and Exercises.

**Unit 7 :-Microcontrollers** : Introduction to Intel 8 bit & 16 bit Microcontrollers, 8051- Architecture, Memory organization, Addressing Modes and exercises

**Unit 8:- Hardware description of 8051:** Instruction formats, Instruction sets, interrupt Structure & interrupt priorities, Port structures & Operation linear counter Functions, different Modes of Operation and Programming examples.

#### TEXT BOOKS :-

- 1."The Intel Microprocessors" Architecture Programming & Interfacing by Barry b Brey.
- 2.Advanced Microprocessors by Kenneth J Ayala, Thomson publishers.
- 3.Microcontrollers by Kenneth J Ayala, Thomson publishers.

#### Reference Books:-

1. Microprocessors & Interfacing Programming & Hardware by DOUGLAS V.Hall
2. Microprocessors & Microcontrollers by Prof. C.R.Sarma

**I- Semester**

**HIGH VOLTAGE D.C. TRANSMISSION**

**Unit 1** :H.V.D.C. Transmission : General considerations, Power Handling Capabilities of HVDC Lines, Basic Conversion principles, static converter configuration.

**Unit 2** : Static Power Converters : 3-pulse, 6-pulse and 12-pulse converters, converter station and Terminal equipment, commutation process, Rectifier and inverter operation, equivalent circuit for converter – special features of converter transformers.

**Unit 3** : Harmonics in HVDC Systems, Harmonic elimination, AC and DC filters.

**Unit 4** : Control of HVDC Converters and systems : constant current, constant extinction angle and constant Ignition angle control. Individual phase control and equidistant firing angle control, DC power flow control.

**Unit 5** : Interaction between HV AC and DC systems – Voltage interaction, Harmonic instability problems and DC power modulation.

**Unit 6** : Multi-terminal DC links and systems; series, parallel and series parallel systems, their operation and control.

**Unit 7** : Transient over voltages in HVDC systems : Over voltages due to disturbances on DC side, over voltages due to DC and AC side line faults

**Unit 8**: Converter faults and protection in HVDC Systems: Converter faults, over current protection - valve group, and DC line protection. Over voltage protection of converters, surge arresters.

**Reference Books :**

1. E.W. Kimbark : Direct current Transmission, Wiley Inter Science – New York.
2. J.Arillaga : H.V.D.C.Transmission Peter Peregrinus ltd., London UK 1983
3. K.R.Padiyar : High Voltage Direct current Transmission, Wiley Eastern Ltd., New Delhi – 1992
4. E.Uhlman : Power Transmission by Direct Current, Springer Verlag, Berlin Helberg – 1985.

**I- Semester**

**DISTRIBUTION AUTOMATION**

**Unit 1:**Distribution Automation and the utility system :

Introduction to Distribution Automation (DA), control system interfaces, control and data requirements, centralized (Vs) decentralized control, DA System (DAS), DA Hardware,DAS software.

**Unit 2:**Distribution Automation Functions :

DA capabilities, Automation system computer facilities, management processes,Information management, system reliability management, system efficiency management,voltage management, Load management.

**Unit 3:**Communication Systems for DA :

DA communication requirements, Communication reliability, Cost effectiveness, Data rate requirements, Two way capability, Ability to communicate during outages and faults,Ease of operation and maintenance, Conforming to the architecture of data flow

**Unit 4:**Communication systems used in DA :

Distribution line carrier (Power line carrier), Ripple control, Zero crossing technique, telephone, cable TV, Radio, AM broadcast, FM SCA, VHF Radio, UHF Radio,Microwave satellite. fiber optics, Hybrid Communication systems, Communicationsystems used in field tests.

**Unit 5:**Technical Benefits :

DA benefit categories, Capital deferred savings, Operation and Maintenance savings, Interruption related savings, Customer related savings, Operational savings, Improvedoperation, Function benefits, Potential benefits for functions, function shared benefits,Guide lines for formulation of estimating equations

**Unit 6:**

Parameters required, economic impact areas, Resources for determining benefits impacton distribution system, integration of benefits into economic evaluation.

**Unit 7:** Economic Evaluation Methods :

Development and evaluation of alternate plans, Select study area, Select study\ period, Project load growth, Develop Alternatives, Calculate operating and maintenance costs,Evaluate alternatives.

**Unit 8:**

Economic comparison of alternate plans, Classification of expenses and capital expenditures, Comparison of revenue requirements of alternative plans, Book Life andContinuing plant analysis, Year by year revenue requirement analysis, short term analysis,end of study adjustment, Break even analysis, Sensitivity analysis computational aids.

**REFERENCE :**

1. IEEE Tutorial Course "Distribution Automation"
2. IEEE Working Group on "Distribution Automation"

**I- Semester**

**ADVANCED DIGITAL SIGNAL PROCESSING  
(Elective-1)**

**UNIT-I: Digital Filter Structure**

Block diagram representation-Equivalent Structures-FIR and IIR digital filter Structures All pass Filters-tunable IIR Digital Filters-IIR tapped cascaded Lattice Structures-FIR cascaded Lattice structures-Parallel-Digital Sine-cosine generator-Computational complexity of digital filter structures.

**UNIT-II: Digital filter design**

Preliminary considerations-Bilinear transformation method of IIR filter design-design of Low pass highpass-Bandpass, and Band stop- IIR digital filters-Spectral transformations of IIR filters- FIR filter design-based on Windowed Fourier series- design of FIR digital filters with least -mean- Square-error-constrained Least-square design of FIR digital filters

**UNIT-III: DSP algorithm implementation**

Computation of the discrete Fourier transform- Number representation-Arithmetic operations-handling of overflow-Tunable digital filters-function approximation.

**UNIT-IV Analysis of finite Word length effects**

The Quantization process and errors- Quantization of fixed -point and floating -point Numbers-Analysis of coefficient Quantization effects - Analysis of Arithmetic Round-off errors-Dynamic range scaling-signal- to- noise ratio in Low -order IIR filters-Low-Sensitivity Digital filters-Reduction of Product round-off errors using error feedback-Limit cycles in IIR digital filters- Round-off errors in FFT Algorithms.

**UNIT V: Power Spectrum Estimation**

Estimation of spectra from Finite Duration Observations signals – Non-parametric methods for power spectrum Estimation – parametric method for power spectrum Estimation-Estimation of spectral form-Finite duration observation of signals-Non-parametric methods for power spectrum estimation-Walsh methods-Blackman & torchy method.

**Reference Books:**

1. Digital signal processing-sanjit K. Mitra-TMH second edition
2. Discrete Time Signal Processing – Alan V.Oppenheim, Ronald W.Shafer - PHI- 1996 1<sup>st</sup> edition-9<sup>th</sup> reprint
3. Digital Signal Processing principles, algorithms and Applications – John G.Proakis -PHI –3<sup>rd</sup> edition-2002
4. Digital Signal Processing – S.Salivahanan, A.Vallavaraj, C. Gnanapriya – TMH - 2<sup>nd</sup> reprint-2001
5. Theory and Applications of Digital Signal Proceesing-LourensR. Rebinar&Bernold
6. Digital Filter Analysis and Design-Auntonian-TMH

**I- Semester**

**DIGITAL CONTROL SYSTEMS  
(Elective-1)**

**UNIT – I SAMPLING AND RECONSTRUCTION**

Introduction, sample and hold operations, Sampling theorem, Reconstruction of original sampled signal to continuous-time signal.

**THE Z – TRANSFORMS**

Introduction, Linear difference equations, pulse response, Z – transforms, Theorems of Z – Transforms, the inverse Z – transforms, Modified Z- Transforms.

**UNIT-II Z-PLANE ANALYSIS OF DISCRETE-TIME CONTROL SYSTEM**

Z-Transform method for solving difference equations; Pulse transforms function, block diagram analysis of sampled – data systems, mapping between s-plane and z-plane: Primary strips and Complementary Strips.

**UNIT – III STATE SPACE ANALYSIS**

State Space Representation of discrete time systems, Pulse Transfer Function Matrix solving discrete time state space equations, State transition matrix and it's Properties, Methods for Computation of State Transition Matrix, Discretization of continuous time state – space equations

**UNIT – IV CONTROLLABILITY AND OBSERVABILITY**

Concepts of Controllability and Observability, Tests for controllability and Observability. Duality between Controllability and Observability, Controllability and Observability conditions for Pulse Transfer Function.

**UNIT – V STABILITY ANALYSIS**

Stability Analysis of closed loop systems in the Z-Plane. Jury stability test – Stability Analysis by use of the Bilinear Transformation and Routh Stability criterion. Stability analysis using Liapunov theorems.

**UNIT – VI DESIGN OF DISCRETE TIME CONTROL SYSTEM BY CONVENTIONAL METHODS**

Design of digital control based on the frequency response method – Bilinear Transformation and Design procedure in the w-plane, Lead, Lag and Lead-Lag compensators and digital PID controllers. Design digital control through deadbeat response method.

**UNIT – VII STATE FEEDBACK CONTROLLERS AND OBSERVERS**

Design of state feedback controller through pole placement – Necessary and sufficient conditions, Ackerman's formula.

State Observers – Full order and Reduced order observers.

**UNIT – VIII Linear Quadratic Regulators**

Min/Max principle, Linear Quadratic Regulators, Kalman filters, State estimation through Kalman filters, introduction to adaptive controls.

**TEXT BOOKS:**

1. Discrete-Time Control systems - K. Ogata, Pearson Education/PHI, 2<sup>nd</sup> Edition
2. Digital Control and State Variable Methods by M.Gopal, TMH

**REFERENCE BOOKS:**

1. Digital Control Systems, Kuo, Oxford University Press, 2<sup>nd</sup> Edition, 2003.
2. *Digital Control Engineering*, M.Gopal

**I- Semester**

**POWER SYSTEM RELIABILITY**

**(Elective-1)**

**Unit I: Generating System Reliability Analysis – I**

Generation system model – capacity outage probability tables – Recursive relation for capacitive model building – sequential addition method – unit removal – Evaluation of loss of load and energy indices – Examples

**Unit II: Generating System Reliability Analysis – II**

Frequency and Duration methods – Evaluation of equivalent transitional rates of identical and non-identical units – Evaluation of cumulative probability and cumulative frequency of non-identical generating units – 2-level daily load representation - merging generation and load models – Examples

**Unit III: Operating Reserve Evaluation**

Basic concepts - risk indices – PJM methods – security function approach – rapid start and hot reserve units – Modelling using STPM approach.

**Unit IV: Bulk Power System Reliability Evaluation**

Basic configuration – conditional probability approach – system and load point reliability indices – weather effects on transmission lines – Weighted average rate and Markov model – Common mode failures.

**Unit V: Inter Connected System Reliability Analysis**

Probability array method – Two inter connected systems with independent loads – effects of limited and unlimited tie capacity - imperfect tie – Two connected Systems with correlated loads – Expression for cumulative probability and cumulative frequency.

**Unit VI: Distribution System Reliability Analysis – I (Radial configuration)**

Basic Techniques – Radial networks –Evaluation of Basic reliability indices, performance indices - load point and system reliability indices – customer oriented, loss and energy oriented indices – Examples

**Unit VII: Distribution System Reliability Analysis - II (Parallel configuration)**

Basic techniques – inclusion of bus bar failures, scheduled maintenance – temporary and transient failures – weather effects – common mode failures –Evaluation of various indices – Examples

**Unit VIII: Substations and Switching Stations:**

Effects of short-circuits - breaker operation – Open and Short-circuit failures – Active and Passive failures – switching after faults – circuit breaker model – preventive maintenance – exponential maintenance times.

**Reference Books:**

1. Reliability Evaluation of Power Systems by Roy Billinton and Ronald N. Allan, Plenum press, New York and London (Second Edition), 1996.
2. Reliability Modeling in Electric Power Systems by J. Endrenyi, John Wiley & Sons, 1978. (First Edition)

**I- Semester**

**POWER SYSTEMS LAB**

1. Fault Analysis of 3-phase Alternator
2. Determination of  $X_d$  and  $X_q$  of 3-phase salient pole Synchronous motor
3. IDMT (Inverse Definite Minimum Time) relay characteristics
4. Determination of breakdown strength of oil by variable distance electrodes.
5. Determination of transmission line parameters.
6. Fault analysis (LL, LG, LLL) of transmission lines.
7. Determination of earth resistance under various conditions.
8. Milli Volt Drop Test (calibration of tongtester).
9. Breakdown characteristic of Sphere air gap.
10. Breakdown characteristic of Plane Rod gap.

**II Semester**

**POWER SYSTEM CONTROL & STABILITY**

**UNIT-I: The Elementary Mathematical Model**

A Classical model of one machine connected to an infinite bus – Classical model of multimachine system – Problems – Effect of the excitation system on Transient stability.

**UNIT-II: System Response to small Disturbances**

The unregulated synchronous Machine – Effect of small changes of speed – modes of oscillation of an unregulated Multimachine system – regulated synchronous machine – voltage regulator with one time lag – Governor with one time lag – Problems.

**UNIT-III: Dynamic Stability**

Concept of Dynamic stability – state space model of one machine system connected to infinite bus – effect of excitation on Dynamic stability – examination of dynamic stability by Routh's criterion

**UNIT-IV: Power system stabilizers**

Introduction to supplementary stabilizing signals- Block diagram of the linear system- Approximate model of the complete exciter – generator system – Lead compensation – Stability aspect using Eigen value approach

**UNIT-V: Excitation systems**

Excitation system response – Non-continuously regulated systems – continuously regulated systems – Excitation system compensation – state space description of the excitation system- simplified linear model – effect of excitation on generator power limits.

**UNIT-VI: Types of Excitation systems**

Type –2 system: rotating rectifier system, Type-3 system: Static with terminal potential and current supplies - Type –4 system: non – continuous acting - Block diagram representation – state space modeling equations of these types.

**UNIT-VII: Stability Analysis using direct method of Lyapunov**

Review of Lyapunov's stability theorems of non-linear systems using energy concept – Method based on first concept – Method based on first integrals – Quadratic forms – Variable gradient method – Zubov's method – Popov's method, Lyapunov function for single machine connected to infinite bus.

**UNIT-VIII: Introduction to Voltage stability**

What is voltage stability – Factors affecting voltage instability and collapse – Comparison of Angle and voltage stability – Analysis of voltage instability and collapse – Integrated analysis of voltage and Angle stability – Control of voltage instability

**Reference books:**

1. P.M.Anderson, A.A.Fouad, "Power System Control and Stability", IOWA State University Press, Galgotia Publications, Vol-I, 1<sup>st</sup> Edition.
2. M.A.Pai, Power System Stability – Analysis by the direct method of Lyapunov. North Holland Publishing Company, Newyork, 1981.
3. K.R. Padiyar, Power System Dynamics (Stability & Control), 2<sup>nd</sup> Edition B.S.Publications, 2002.

**II Semester**

**FLEXIBLE AC TRANSMISSION SYSTEMS**

**Unit 1: FACTS Concepts:**

Transmission interconnections power flow in an AC system, loading capability limits, Dynamic stability considerations, importance of controllable parameters basic types of FACTS controllers, benefits from FACTS controllers.

**Unit 2: Voltage Source Converters:**

Single phase three phase full wave bridge converters transformer connections for 12 pulse 24 and 48 pulse operation.

**Unit 3:**

Three level voltage source converter, pulse width modulation converter, basic concept of current source Converters, comparison of current source converters with voltage source converters.

**Unit 4: Static Shunt Compensation:**

Objectives of shunt compensation, mid point voltage regulation voltage instability prevention, improvement of transient stability, Power oscillation damping,

**Unit 5:**

Methods of controllable var generation, variable impedance type static var generators switching converter type var generators hybrid var generators.

**Unit 6: SVC and STATCOM:**

The regulation and slope transfer function and dynamic performance, transient stability enhancement and power oscillation damping operating point control and summary of compensator control.

**Unit 7: Static Series Compensators:**

concept of series capacitive compensation, improvement of transient stability, power oscillation damping

**Unit 8:**

Functional requirements. GTO thyristor controlled series capacitor(GSC), thyristor switched series capacitor(TSSC), and thyristor controlled series capacitor(TCSC) control schemes for GSC TSSC and TCSC.

**Text Book :**

1. "Understanding FACTS Devices" N.G. Hingorani and L. Guygi. IEEE Press Publications 2000.

**II Semester**

**EXTRA HIGH VOLTAGE TRANSMISSION**

**Unit 1 :** E.H.V. A.C. Transmission line trends and preliminary aspects standard transmission voltages – power handling capacities and line losses – mechanical aspects.

**Unit 2 :** Calculation of line resistance and inductances : resistance of conductors, temperature rise of conductor and current carrying capacity. Properties of bundled conductors and geometric mean radius of bundle, inductance of two conductor lines and multi – conductor lines, Maxwell's coefficient matrix.

**Unit 3 :** Line capacitance calculation : capacitance of two conductor line, and capacitance of multi conductor lines, potential coefficients for bundled conductor lines, sequence inductances and capacitances and diagonalization.

**Unit 4 :** Calculation of electro static field traveling waves due to corona – Audio noise due to corona, its generation, characteristics and limits measurement of audio noise.

**Unit 5 :** Surface voltage Gradient on conductors, surface gradient on 2 conductor bundle and cosine law, Maximum surface voltage gradient of bundle with more than 3 sub conductors, Mangolt formula.

**Unit 6 :** Corona : Corona in EHV lines – corona loss formulate – attenuation of traveling waves due to corona – Audio noise due to corona, its generation, characteristics and limits measurement of audio noise.

**Unit 7 :** Power Frequency voltage control : Problems at power frequency, generalized constants, No load voltage conditions and charging currents, voltage control using synchronous condenser, cascade connection of components : Shunt and series compensation, sub synchronous resonance in series – capacitor compensated lines

**Unit 8 :** Static reactive compensation systems : Introduction, SVC schemes, Harmonics injected in to network by TCR, design of filters for suppressing harmonics injected in to the system.

**Reference Books :**

1. Extra High Voltage AC Transmission Engineering – Rakosh Das Begamudre, Wiley Eastern Ltd., New Delhi – 1987.
2. EHV Transmission line reference book – Edison Electric Institute (GEC) 1986.

**II Semester**

**NEURAL & FUZZY SYSTEMS**

**Unit – I: Introduction to Neural Networks**

Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Hodgkin-Huxley Neuron Model, Integrate-and-Fire Neuron Model, Spiking Neuron Model, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential Applications of ANN.

**Unit- II: Essentials of Artificial Neural Networks**

Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity, Neural Dynamics (Activation and Synaptic), Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules, Types of Application

**Unit-III:**

**Feed Forward Neural Networks**

Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications.

**Multilayer Feed forward Neural Networks**

Credit Assignment Problem, Generalized Delta Rule, Derivation of Backpropagation (BP) Training, Summary of Backpropagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

**Unit IV: Associative Memories**

Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory (Associative Matrix, Association Rules, Hamming Distance, The Linear Associator, Matrix Memories, Content Addressable Memory), Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function, Proof of BAM Stability Theorem

Architecture of Hopfield Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis, Capacity of the Hopfield Network.

**Unit V: Self-Organizing Maps (SOM) and Adaptive Resonance Theory (ART)**

Introduction, Competitive Learning, Vector Quantization, Self-Organized Learning Networks, Kohonen Networks, Training Algorithms, Linear Vector Quantization, Stability-Plasticity Dilemma, Feed forward competition, Feedback Competition, Instar, Outstar, ART1, ART2, Applications.

**Unit – VI: Classical & Fuzzy Sets**

Introduction to classical sets - properties, Operations and relations; Fuzzy sets, Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions.

**UNIT VII: Fuzzy Logic System Components**

Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

## **UNIT VIII: Applications**

**Neural network applications:** Process identification, Function Approximation, control and Process Monitoring, fault diagnosis and load forecasting.

**Fuzzy logic applications:** Fuzzy logic control and Fuzzy classification.

### **TEXT BOOK:**

1. Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications by Rajasekharan and Rai – PHI Publication.
2. Introduction to Artificial Neural Systems - Jacek M. Zurada, Jaico Publishing House, 1997.

### **REFERENCE BOOKS:**

1. Neural and Fuzzy Systems: Foundation, Architectures and Applications, - N. Yadaiah and S. Bapi Raju, Pearson Education
2. Neural Networks – James A Freeman and Davis Skapura, Pearson, 2002.
3. Neural Networks – Simon Hykins , Pearson Education
4. Neural Engineering by C.Eliasmith and CH.Anderson, PHI
5. Neural Networks and Fuzzy Logic System by Bork Kosko, PHI Publications

**II Semester**

**REAL TIME CONTROL OF POWER SYSTEMS**

**UNIT I**

Power system control-operation, operator activities, control center, elements of computer control system

**UNIT II**

Supervisory and control functions – data acquisition, monitoring and event processing, control functions

**UNIT III**

Time tagged data, disturbance data collection and analysis, reports and calculations

**UNIT IV**

Man-machine communication – operators console, VDU display, operator dialogs, mimic diagrams, printing facilities

**UNIT V**

Real time software – Classification of programs, Structure of real time programs, construction techniques and tools

**UNIT VI**

Programming language requirements for process control

**UNIT VII**

Computer control of power systems – Evolution, time scale of system control, online control, Software for state estimation

**UNIT VIII**

Generation and load control, security analysis, Software coordination

**REFERENCE BOOKS:**

1. “Power system control-technology” by Torsten Cegrell, Prentice Hall.
2. “Real time computer control” by S.Bennett and D.A.Linkens, IEE series.

**II Semester**

**OPERATION RESEARCH**  
(Elective –II)

**Unit 1:**

Linear Programming Problem: Formulation – Graphical method - Simplex method – Artificial variable techniques – Big-M tune –phase methods

**Unit 2:**

Duality theorem – Dual simplex method – Sensitivity analysis - effect of changes in cost coefficients, Constraint constants, Addition/Deletion of variables & constraints

**Unit 3:**

Transportation problem – formulation – Initial basic feasible solution methods – Northwest, Least cost & Vogels methods, MODI optimization - Unbalanced & degeneracy treatment

**Unit 4:**

Assignment problem – Formulation – Hungarian method – Variants of assignment problems, Sequencing problems – Flow shop sequencing – n jobs×2 machines sequencing - n jobs×3 machines sequencing – Job-shop sequencing – 2 jobs×m machines sequencing – Graphical methods

**Unit 5:**

Game Theory - Introduction - Terminology – Saddle point games - with out Saddle point games - 2×2 games, analytical method - 2×n and m×2 games – graphical method – dominance principle

**Unit 6:**

Dynamic programming – Bellman’s principle of optimality – short route – capital investment – inventory allocation

**Unit 7:**

Non linear optimization – Single variable optimization problem – Unimodal function - Elimination methods – Fibonacci & Golden reaction methods - Interpolation methods - Quadratic & cubic interpolation method.

Multi variable optimization problem – Direct search methods – Univariate method – Pattern search methods – Powell’s, Hook-Jeaves & Rosen-brock’s search method.

**II Semester**

**Unit 8:**

Geometric programming – Polynomial – Arithmetic – Seametric inequality – Unconstrained G.P – Constraint G.P with  $\leq$  type constraint.

**Simulation:** Definition – Types- steps- Simulation of simple electrical systems – Advantages and Disadvantages

**TEXT BOOKS:**

1. Optimization theory & Applications – S.S.Rao, New Age Internationals
2. Operations Research - S.D.Sharma, Galgotia publishers
3. Operations Research – Kausur & Kumar, Spinger Publishers

**REFERENCES:**

1. Optimization techniques: Theory & Practice – M.C.Joshi & K.M. More Ugalya, Narosa Publications
2. Optimization : Theory & Practice – Beweridze, Mc Graw Hill
3. Simulation Modelling & Analysis – Law & Kelton –TMH
4. Optimization Concepts and Applications in Engineering- A.D. Belegundu , J.R. Chandrupata, Pearson Education, Asia

**II Semester**

**EMBEDDED SYSTEMS**  
**(Elective-II)**

**Unit I**

**Embedded Computing:** Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples.  
(Chapter I from Text Book 1, Wolf)

**Unit II**

**The 8051 Architecture :** Introduction, 8051 Micro controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Interrupts.  
**(Chapter 3 from Text Book 2, Ayala)**

**Unit III**

**Basic Assembly Language Programming Concepts :** The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051.  
Data Transfer and Logical Instructions.  
**(Chapters 4,5 and 6 from Text Book 2, Ayala)**

**Unit IV**

Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts.  
**(Chapter 7 and 8 from Text Book 2, Ayala)**

**Unit-V**

**Applications:** Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication.  
**(Chapter 10 and 11 from Text Book 2, Ayala)**

**Unit VI**

**Introduction to Real – Time Operating Systems:** Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment  
**(Chapter 6 and 7 from Text Book 3, Simon)**

**Unit VII**

**Basic Design Using a Real-Time Operating System:** Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source); Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System; Debugging Techniques: Testing on Host Machine, Using Laboratory Tools, An Example System.  
**(Chapter 8,9,10 and 11 from Text Book 3, Simon)**

**Unit VIII**

Introduction to advanced architectures: ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I<sup>2</sup>C bus and CAN bus; Internet-Enabled Systems, Design Example-Elevator Controller.  
**(Chapter 8 from Text Book 1, Wolf)**

**II Semester**

**Text Books:**

1. Computers and Components, Wayne Wolf, Elseveir.
2. The 8051 Microcontroller, Third Edition, Kenneth J.Ayala, Thomson.
3. An Embedded Software Primer, David E. Simon, Pearson Education.

**Reference Books:**

1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj kamal, Pearson Education.

**II Semester**

**POWER QUALITY  
(Elective-II)**

**Unit 1: Introduction :**

Introduction of the Power Quality (PQ) problem, Terms used in PQ: Voltage, Sag, Swell, Surges, Harmonics, over voltages, spikes, Voltage fluctuations, Transients, Interruption, overview of power quality phenomenon, Remedies to improve power quality, power quality monitoring

**Unit 2: Long Interruptions**

Interruptions – Definition – Difference between failure, outage, Interruptions – causes of Long Interruptions – Origin of Interruptions – Limits for the Interruption frequency – Limits for the interruption duration – costs of Interruption – Overview of Reliability evaluation to power quality, comparison of observations and reliability evaluation.

**Unit 3: Short Interruptions**

Short interruptions – definition, origin of short interruptions, basic principle, fuse saving, voltage magnitude events due to re-closing, voltage during the interruption, monitoring of short interruptions, difference between medium and low voltage systems. Multiple events, single phase tripping – voltage and current during fault period, voltage and current at post fault period, stochastic prediction of short interruptions.

**Unit 4: Voltage sag – characterization – Single phase:**

Voltage sag – definition, causes of voltage sag, voltage sag magnitude, monitoring, theoretical calculation of voltage sag magnitude, voltage sag calculation in non-radial systems, meshed systems, voltage sag duration.

**Unit 5: Voltage sag – characterization – Three phase:**

Three phase faults, phase angle jumps, magnitude and phase angle jumps for three phase unbalanced sags, load influence on voltage sags.

**Unit 6: PQ considerations in Industrial Power Systems:**

Voltage sag – equipment behaviour of Power electronic loads, induction motors, synchronous motors, computers, consumer electronics, adjustable speed AC drives and its operation. Mitigation of AC Drives, adjustable speed DC drives and its operation, mitigation methods of DC drives.

**Unit 7: Mitigation of Interruptions and Voltage Sags:**

Overview of mitigation methods – from fault to trip, reducing the number of faults, reducing the fault clearing time changing the power system, installing mitigation equipment, improving equipment immunity, different events and mitigation methods. System equipment interface – voltage source converter, series voltage controller, shunt controller, combined shunt and series controller.

**Unit 8: Power Quality and EMC Standards:**

Introduction to standardization, IEC Electromagnetic compatibility standards, European voltage characteristics standards, PQ surveys.

**Reference Book:**

1. “Understanding Power Quality Problems” by Math H J Bollen. IEEE Press.

**II Semester**

**ELECTRICAL SYSTEMS SIMULATION LAB**

1. Write program and simulate dynamical system of following models:
  - a) I/O Model
  - b) State variable modelAlso identify time domain specifications of each.
2. Obtain frequency response of a given system by using various methods:
  - (a) General method of finding the frequency domain specifications.
  - (b) Polar plot
  - (c) Bode plotAlso obtain the Gain margin and Phase margin.
3. Determine stability of a given dynamical system using following methods.
  - a) Root locus
  - b) Bode plot
  - c) Nyquist plot
  - d) Liapunov stability criteria
4. Transform a given dynamical system from I/O model to state variable model and vice versa.
5. Obtain model matrix of a given system, obtain its diagonalize form if exists or obtain Jordon Canonical form of system.
6. Write a program and implement linear quadratic regulator
7. Design a compensator for a given systems for required specifications.
8. Conduct a power flow study on a given power system.
9. Design a PID controller.
10. Conduct a power flow study on a given power system network using Guass-Seidel iterative method.
11. Develop a program to solve Swing Equation.
12. Develop a Simulink model for a single area load frequency problem and simulate the same.
13. Develop a Simulink model for a two-area load frequency problem and simulate the same.
14. Design a PID controller for two-area power system and simulate the same.
15. PSPICE Simulation of Single phase full converter using RL&E loads.
16. PSPICE Simulation of Three phase full converter using RL&E loads.
17. PSPICE Simulation of Single phase AC Voltage controller using RL load.
18. PSPICE Simulation of Three phase inverter with PWM controller.
19. PSPICE Simulation of resonant pulse commutation circuit.
20. PSPICE Simulation of impulse commutation circuit.

\*\*\*

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING  
III Sem. M.Tech. (Power System Control & Automation)

Date: 30.08.2010

**Allotment of M.Tech. (PSCA) Project Topics/Areas and Project Supervisors**  
***{For 2009-Admitted Batch Autonomous Stream- 1<sup>st</sup> Batch }***

Register No.	Name of the Student	Project Topic Allotted	Project Supervisor Allotted
09131D5309	Pavan Kumar Pasumarthi	1. Power System Stability Studies	Sh. K.V.S.R. Murthy
09131D5305	Kameswari Kandula	1. Power System Stability Studies	Sh. A. Ravi Shankar
09131D5304	Jincy T.V.	1. Load Flows	Dr.K. Narasimha Rao
09131D5303	Durga Malleswara Rao K.	1. Fuzzy Logic Application to Power System	Mr. V. G. Srujan
09131D5316	Srikanth Balla	1. Design and Simulation of Harmonic Filters - Active Fillers	Sh. P. K. Das
09131D5307	Mabushuvan Kiladi	1. Multilevel Inverter – Grid Connection	Sh. G.V.E. Satish Kumar
09131D5314	Shefali Apoorva	1. Power Systems Protection	Sh. H. Madan Mohan
09131D5318	V. V. Ramana Guptaji B	1. Power System Protection	Sh. G.V.E.Satish Kumar
09131D5301	Ammanabrolu Venkata Rajesh	1. Power System Stability Studies	Smt. G. Chaitanya Sudha
09131D5308	Madhu Babu Paila	1. Distribution Systems	Sh. K.V.S.R. Murthy
09131D5313	Seelam Swarupa	1. Power System protection	Sh. A. Ravi Shankar
09131D5317	Varaprasad K. S. B.	2. HVDC Transmission	Sh. G. Lakshmi Narayana
09131D5302	Dharani Komala Rao Matangi	1. Wind Power Generation	Sh. A. S. R. Sekhar
09131D5306	Komali Veeranki	1. Application of A.I. to Power Systems	Smt. B. Aruna Kumari
09131D5312	Ravi Kumar Pappu	3. FACTS Applications	Sh. Pawan Puthra Pappu
09131D5310	Pydiraju Chintapalli	3. Optimal Power Flow	Sh. K. Ravi Kumar
09131D5315	Siddabathula Vamsi Krishna	2. Distribution Systems	Sh. B. Viswanath

(B. VISWANATH)  
Associate Professor & Deptl. P.G. Co-ordinator

(Dr. K. NARASIMHA RAO)  
Professor & HOD (EEE)