LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (Autonomous)

L.B. Reddy Nagar, Mylavaram-521 230. Andhra Pradesh, INDIA
Affiliated to JNTUK, Kakinada & Approved by AICTE New Delhi
NAAC Accredited with "A" grade, Accredited by NBA,
New Delhi & Certified by ISO 9001:2008, http://www.lbrce.ac.in

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

Phone: 08659-222933/Extn: 203 hodeee@lbrce.ac.in, eee.lbrce@gmail.com

LESSON PLAN

Name of the faculty: MS.V. SIVAPARVATHI **Semester: II A.Y:2015-16**
Course Title: DSP PROCESSORS & FPGA **M.TECH.**

S.No.	Date as per Academic Calendar / Actual Date	Topic	Teaching Methodology	Faculty approach	Student approach	Remarks
1)	08-03-2016	Introduction to subject	DM1, DM3	Explanation	Listens and Participate	
2)	10-03-2016	Introduction to subject	DM1, DM3	Explanation	Listens and Participate	
3)	10-03-2016	Introduction to subject	DM1, DM3	Explanation	Listens and Participate	
4)	14-03-2016	**Unit - I Introduction**	DM1, DM3	Explanation	Listens and Participate	
5)	14-03-2016	Digital signal-processing system	DM1, DM3	Explanation	Listens and Participate	

6)	15-03-2016	Digital signal-processing system	DM1, DM3	Explanation	Listens and Participate	
7)	17-03-2016	sampling process	DM1, DM3	Explanation	Listens and Participate	
8)	17-03-2016	sampling process	DM1, DM3	Explanation	Listens and Participate	
9)	21-03-2016	Discrete Fourier Transform (DFT)	DM1, DM3	Explanation	Listens and Participate	
10)	21-03-2016	Discrete Fourier Transform (DFT)	DM1, DM3	Explanation	Listens and Participate	
11)	22-03-2016	Discrete Fourier Transform (DFT)	DM1, DM3	Explanation	Listens and Participate	
12)	24-03-2016	Fast Fourier Transform (FFT)	DM1, DM3	Explanation	Listens and Participate	
13)	24-03-2016	Fast Fourier Transform (FFT)	DM1, DM3	Explanation	Listens and Participate	
14)	28-03-2016	Fast Fourier Transform (FFT)	DM1, DM3, DM8	Explanation, facilitates	Listens and Participate	
15)	28-03-2016	Basic Architectural features of DSP processor TMS320F28X	DM1, DM3, DM8	Explanation, facilitates	Listens and Participate	
16)	29-03-2016	Basic Architectural features of DSP processor TMS320F28X	DM1, DM3, DM8	Explanation, facilitates	Listens and Participate	
17)	31-03-2016	Basic Architectural features of DSP processor TMS320F28X	DM1, DM3, DM8	Explanation, facilitates	Listens and Participate	
18)	31-03-2016	Memory Mapping	DM1, DM3, DM8	Explanation, facilitates	Listens and Participate	
19)	4-04-2016	Memory Mapping	DM1, DM3, DM8	Explanation, facilitates	Listens and Participate	
20)	4-04-2016	Memory Mapping				

			DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
21	5-04-2016	**Unit - II Introduction**	DM1, DM3	Explanation	Listens and Participate	
22	7-04-2016	I/O AND Event managers	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
23	11-04-2016	Pin Multiplexing (MUX)	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
24	11-04-2016	Pin Multiplexing (MUX)	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
25	12-04-2016	General Purpose I/O Overview	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
26	14-04-2016	General Purpose I/O Overview	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
27	14-04-2016	Peripheral interrupt expansion unit	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
28	15-04-2016	Peripheral interrupt expansion unit	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
29	18-04-2016	Overview of the Event manager (EV)	DM1, DM3, DM8	Explanation , facilitates	Participate	
30	18-04-2016	Overview of the Event manager (EV)	DM1, DM3, DM8	Explanation , facilitates	Participate	
31	19-04-2016	Capture UNITs	DM1, DM3	Explanation	Listens and Participate	
32	21-04-2016	Capture UNITs	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
33	21-04-2016	Quadrature Encoder Pulse (QEP) Circuit	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	

34	2-05-2016	Quadrature Encoder Pulse (QEP) Circuit	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
35	2-05-2016	**Revision**	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
36	3-05-2016	**Revision**	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
37	5-05-2016	**Unit - III Introduction** DSP PROGRAMMING	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
38	9-05-2016	Instruction Set	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
39	10-05-2016	data transfer	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
40	12-05-2016	arithmetic and logical instructions	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
41	12-05-2016	arithmetic and logical instructions	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
42	6-06-2016	Conditional instructions	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
43	7-06-2016	bit operating instructions	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	

44	9-06-2016	**Programming**	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
45	13-06-2016	Arithmetic operations	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
46	14-06-2016	Logical operations	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
47	16-06-2016	Generation of pulse	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
48	16-06-2016	**Unit - IV FPGA Itroduction**	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
49	20-06-2016	Introduction to CPLD	DM1, DM3, DM8	Explanation , facilitates	Listens and Participate	
50	21-06-2016	CPLD vs FPGA	DM1, DM3	Explanation	Listens and Participate	
51	23-06-2016	Types of FPGA	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
52	23-06-2016	configurable logic blocks	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
53	27-06-2016	configurable logic blocks	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
54	27-06-2016	Features and applications	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
55	28-06-2016	Input output bl0ck	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
56	30-06-2016	Programmable Interconnect point	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
57	30-06-2016	**Unit – V HDL PROGRAMMING Introduction**	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
58	4-07-2016	Instruction Set				

			DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
59	4-07-2016	data transfer	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
60	5-07-2016	arithmetic instructions	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	

61	5-07-2016	arithmetic instructions	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
62	5-07-2016	logical instructions	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
63	7-07-2016	logical instructions	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
64	7-07-2016	Conditional instructions	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
65	7-07-2016	Conditional instructions	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
66	11-07-2016	Conditional instructions	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
67	11-07-2016	Bit operating instructions	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
68	11-07-2016	Bit operating instructions	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
69	12-07-2016	Bit operating instructions	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
70	12-07-2016	Programming	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
71	14-07-2016	Programming	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
72	14-07-2016	Arithmetic operations				

			DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
73	18-07-2016	Arithmetic operations	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	

74	18-07-2016	Logical operations	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
75	19-07-2016	Generation of pulse	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
76	21-07-2016	Revision	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	
77	21-07-2016	Revision	DM1, DM3, DM5, DM8	Explanation , facilitates	Listens and Participate	

NOTE: DELIVERY METHODS : **DM1**: Lecture interspersed with discussions/BB, **DM2:** Tutorial, **DM3:** Lecture with a quiz, **DM4**: Assignment/Test, **DM5**: Demonstration (laboratory, field visit), **DM6**: Group Discussion, **DM7:** Group Assignment/ Project, **DM8:** Presentations/PPT, **DM9**:Asynchronous Discussion..

Signature				
	Name of the faculty	Name of the course Co-ordinator	Name of the Module Co-ordinator	HOD
	Ms. V. Sivaparvathi	Ms. V. Sivaparvathi		Dr. M. Umavani

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Lesson PlanDate:08-03-2016

Name of the faculty: Dr M. Uma Vani Course: M.Tech Semester:II A.Y:2015-16
Course Title: HVDC & FACTS

L.No.	Dt as perAca. Calendar / Actual Date	Content	TeachingMethy	Faculty Approach	Student approach	Learning outcome	Remarks
1.	8-03-2016	Introduction to HVDC System	DM1	Explanation	Listens and Participates	Introduction to HVDC	
2.	9-03-2016	Introduction to HVDC System	DM1	Explanation	Listens and Participates	Introduction to HVDC	
3.	10-03-2016		DM1	Explanation	Listens and Participates		
4.	10-03-2016	Types of dc links	DM1	Explanation	Listens and Participates	Types of dc links	
5.	11-03-2016	Monopolar	DM1	Explanation	Listens and Participates	Monopolar	
	15-03-2016						

6.		Bipolar	DM1	Explanation	Listens and Participates	Bipolar	
7.	16-03-2016	Homopolar	DM1	Explanation	Listens and Participates	Homopolar	
8.	17-03-2016	schematic of HVDC transmission	DM1	Explanation	Listens and Participates	schematic of HVDC transmission system	
9.	17-03-2016	schematic of HVDC transmission	DM1	Explanation	Listens and Participates	schematic of HVDC transmission system	
10.	18-03-2016	schematic of HVDC transmission	DM1	Explanation	Listens and Participates	schematic of HVDC transmission system	
11.	22-03-2016	Seminar-I	DM2		Listens and Participates	Seminar-I	
12.	23-03-2016	greatz circuit	DM1	Explanation	Listens and Participates	greatz circuit	
13.	24-03-2016	Analysis of greatz circuit without	DM1	Explanation	Listens and Participates	Analysis of greatz circu without overlap	
14.	24-03-2016	Analysis of greatz circuit with ove	DM1	Explanation	Listens and Participates	Analysis of greatz circu overlap	
15.	29-03-2016	Analysis of greatz circuit with ove	DM1	Explanation	Listens and Participates	Analysis of greatz circu overlap	
16.	30-03-2016	Control system hierarchy	DM1	Explanation	Listens and Participates	Control system hierarcl	
17.	31-03-2016	Seminar-II	DM2		Listens and Participates	Seminar-II	
18.	31-03-2016	converter control characteristics	DM1	Explanation	Listens and Participates	converter control characteristics	
	1-04-2016						

19.		Basic control characteristics	DM1	Explanation	Listens and Participates	Basic control character	
20.	5-04-2016	Firing angle control	DM1	Explanation	Listens and Participates	Firing angle control	
21.	6-04-2016	Current controller	DM1	Explanation	Listens and Participates	Current controller	
22.	7-04-2016	Constant extinction angle control	DM1	Explanation	Listens and Participates	Constant extinction ang control	
23.	7-04-2016	principle of D.C link control	DM1	Explanation	Listens and Participates	principle of D.C link co	
24.	12-04-2016	starting and stopping of D.C link	DM1	Explanation	Listens and Participates	starting and stopping o link	
25.	13-04-2016	**MULTI TERMINAL DC LINK SYSTEMS**	DM1	Explanation	Listens and Participates	multi terminal dc links systems	
26.	19-04-2016	Series	DM1	Explanation	Listens and Participates	Series	
27.	20-04-2016	Parallel	DM1	Explanation	Listens and Participates	Parallel	
28.	21-04-2016	Seminar-III	DM2		Listens and Participates	Seminar-III	
29.	21-04-2016	Converter fault types	DM1	Explanation	Listens and Participates	Converter fault types	
30.	22-04-2016	protection against over-current	DM1	Explanation	Listens and Participates	protection against over	
31.	3-05-2016	protection against over-voltage	DM1	Explanation	Listens and Participates	protection against over	
	4-05-2016						

32.		types of harmonics in HVDC syst	DM1	Explanation	Listens and Participates	types of harmonics in H systems	
33.	5-05-2016	filters	DM1	Explanation	Listens and Participates	filters	
34.	5-05-2016	AC and DC filters	DM1	Explanation	Listens and Participates	AC and DC filters	
35.	6-05-2016	Mid-I Examinations	DM4			Mid-I Examinations	
36.	10-05-2016						
37.	11-05-2016						
38.	12-05-2016	**FACTS CONCEPTS**	DM1	Explanation	Listens and Participates	facts concepts	
39.	12-05-2016	Power flow in AC systems	DM1	Explanation	Listens and Participates	Power flow in AC syst	
40.	13-05-2016	Definitions of FACTS	DM1	Explanation	Listens and Participates	Definitions of FACTS	
41.	7-06-2016	Basic types of FACTS controllers	DM1	Explanation	Listens and Participates	Basic types of FACTS controllers	
42.	08-06-2016	power flow control	DM1	Explanation	Listens and Participates	power flow control	
43.	09-06-2016	Seminar-IV	DM2		Listens and Participates	Seminar-IV	
44.	09-06-2016	constraints of maximum transmiss loading	DM1	Explanation	Listens and Participates	constraints of maximur transmission line loadi	
45.	10-06-2016	loading capability limits	DM1	Explanation	Listens and Participates	loading capability limit	
	14-06-2016						

46.		dynamic stability considerations	DM1	Explanation	Listens and Participates	dynamic stability considerations	
47.	15-06-2016	benefits from FACTS controllers	DM1	Explanation	Listens and Participates	benefits from FACTS controllers	
48.	16-06-2016	Seminar-V	DM2		Listens and Participates	Seminar-V	
49.	16-06-2016	**SERIES & SHUNT COMPENSATIONS**	DM1	Explanation	Listens and Participates	series & shunt compens	
50.	17-06-2016	Concepts of static series compens	DM1	Explanation	Listens and Participates	Concepts of static serie compensation	
51.	21-06-2016	GCSC	DM1	Explanation	Listens and Participates	GCSC	
52.	22-06-2016	TCSC	DM1	Explanation	Listens and Participates	TCSC	
53.	23-06-2016	TSSC	DM1	Explanation	Listens and Participates	TSSC	
54.	23-06-2016	applications	DM1	Explanation	Listens and Participates	applications	
55.	24-06-2016	Seminar-VI	DM2		Listens and Participates	Seminar-VI	
56.	28-06-2016	Static Synchronous Series Compe (SSSC)	DM1	Explanation	Listens and Participates	Static Synchronous Ser Compensator (SSSC)	
57.	28-06-2016	Principles of shunt compensation	DM1	Explanation	Listens and Participates	Principles of shunt compensation	
58.	29-06-2016	Variable Impedance type	DM1	Explanation	Listens and Participates	Variable Impedance typ	

59.		switching converter type	DM1	Explanation	Listens and Participates	switching converter typ	
60.	29-06-2016	Static Synchronous Compensator (STATCOM) configuration	DM1	Explanation	Listens and Participates	Static Synchronous Compensator (STATC configuration	
61.	30-06-2016	Seminar-VII	DM2		Listens and Participates	Seminar-VII	
62.	30-06-2016	Static Synchronous Compensator (STATCOM) configuration	DM1	Explanation	Listens and Participates	Static Synchronous Compensator (STATC configuration	
63.	1-07-2016	characteristics	DM1	Explanation	Listens and Participates	characteristics	
64.	5-07-2016	control	DM1	Explanation	Listens and Participates	control	
65.	7-07-2016	**UNIFIED POWER FLOW CONTROLLER**	DM1	Explanation	Listens and Participates	unified power flow con	
66.	7-07-2016	Introduction	DM1	Explanation	Listens and Participates	Introduction	
67.	8-07-2016	Seminar-VIII	DM2		Listens and Participates	Seminar-VIII	
68.	12-07-2016	Unified Power Flow Controller	DM1	Explanation	Listens and Participates	Unified Power Flow C	
69.	13-07-2016	Unified Power Flow Controller	DM1	Explanation	Listens and Participates	Unified Power Flow C	
70.	14-07-2016	Basic Operating Principles	DM1	Explanation	Listens and Participates	Basic Operating Princi	
71.	14-07-2016	Conventional Transmission Contr Capabilities	DM1	Explanation	Listens and Participates	Conventional Transmis Control Capabilities	
	15-07-2016						

72.		Conventional Transmission Contr Capabilities	DM1	Explanation	Listens and Participates	Conventional Transmis Control Capabilities	
73.	15-07-2016	Seminar-IX	DM2		Listens and Participates	Seminar-IX	
74.	19-07-2016	Independent Real and Reactive Po Flow Control	DM1	Explanation	Listens and Participates	Independent Real and F Power Flow Control	
75.	19-07-2016	Independent Real and Reactive Po Flow Control	DM1	Explanation	Listens and Participates	Independent Real and F Power Flow Control	
76.	19-07-2016	Seminar-X	DM2	Explanation	Listens and Participates	Seminar-X	
77.	20-07-2016	Control Structure	DM1	Explanation	Listens and Participates	Control Structure	
78.	20-07-2016	Basic Control system for P and Q	DM1	Explanation	Listens and Participates	Basic Control system f Q Control	
79.	21-07-2016	Basic Control system for P and Q	DM2		Listens and Participates	Basic Control system f Q Control	
80.	21-07-2016	Seminar-XI	DM1	Explanation	Listens and Participates	Seminar-XI	
81.	22-07-2016	Seminar-XII	DM2		Listens and Participates	Seminar-XII	
82.	22-07-2016	Revision	DM1	Explanation	Listens and Participates	Revision	
83.							
84.							
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90.							
91.							

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Signature				
	Name of the faculty	Name of the course Co-ordinator	Name of the Module Co-ordinator	HOD

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Lesson plan

Date: 08-03-2017

Name of the faculty: E.RAGHU BABU **Semester:II(M.Tech)** **A.Y:2015-16**
Course Title: CONTROL OF MOTOR DRIVES-II (MTEE 202)

Lecture *No.*	Date as per Aca. Calender/Actual date	*Content*	*Teaching Methodology*	*Faculty Approach*	*Student approach*	*Learning outcome*
1.	8-03-2016	**UNITI:VECTOR CONTROL OF INDUCTION MOTOR** introduction	DM1	Explanation	Listens and participate	Know the objective of the subject
2.	9-03-2016	Kron's primitive machine model	DM1	Explanation	Listens and participate	Understand kron's primitive machine model
3.	10-03-2016	Introduction and principle of vector control	DM1	Explanation	Listens and participate	Understand the vector control principle
4.	10-03-2016	Control algorithm of vector control	DM1	Explanation	Listens and participate	Know the step by step process Implement the vector control
5.	11-03-2016	Seminar-1	DM2	Explanation	Listens and participate	
6.	15-03-2016	Derivation of indirect vector control				

			DM1	Explanation	Listens and participate	Derive the expression to implement indirect vector control
7.	16-03-2016	Indirect vector control scheme	DM1	Explanation	Listens and participate	Understand indirect vector control
8.	17-03-2016	Problems on indirect vector control	DM1	Explanation	Listens and participate	Solve the problems on indirect vector control
9.	17-03-2016	Problems on indirect vector control	DM1	Explanation	Listens and participate	Solve the problems on indirect vector control
10.	18-03-2016	Seminar-2	DM2	Explanation	Listens and participate	
11.	22-03-2016	Implementation of indirect vector control	DM1	Explanation	Listens and participate	Implement indirect vector control
12.	23-03-2016	Direct vector control schene	DM1	Explanation	Listens and participate	Understand direct vector control
13.	24-03-2016	Direct vector control scheme	DM1	Explanation	Listens and participate	Implement direct vector control scheme
14.	24-03-2016	Flux weakening operation ,Flux weakening in stator flux linkage controlled scheme	DM1	Explanation	Listens and participate	Understand the flux weakening operation
15.	29-03-2016	Seminar-3	DM2	Explanation	Listens and participate	
16.	30-03-2016					

		Problem on rotor flux oriented vector control	DM1	Explanation	Listens and participate	Solve the problems on rotor flux oriented vector control
17.	31-03-2016	Flux weakening in rotor flux linkage controlled scheme	DM1	Explanation	Listens and participate	Understand the flux weakening in rotor flux control scheme
18.	31-03-2016	**UNITII: SENSORLESS VECTOR CONTROL OF INDUCTION MOTOR** Slip and Speed Estimation at low performance	DM1	Explanation	Listens and participate	Understand the slip an speed estimation
19.	1-04-2016	Rotor Angle and Flux linkage Estimation at high performance	DM1	Explanation	Listens and participate	Understand the speed estimation by Rotor Angle and Flux linkage
20.	5-04-2016	Seminar-4	DM2	Explanation	Listens and participate	
21.	6-04-2016	Rotor Angle and Flux linkage Estimation at high performance	DM1	Explanation	Listens and participate	Understand the speed estimation by Rotor Angle and Flux linkage
22.	7-04-2016	estimators using rotor slot harmonics	DM1	Explanation	Listens and participate	Analyze the speed by using rotor slot harmonics
23.	7-04-2016	estimators using rotor slot harmonics	DM1	Explanation	Listens and participate	Analyze the speed by using rotor slot harmonics
24.	12-04-2016	Seminar-5	DM2	Explanation	Listens and participate	

25.	13-04-2016	Model Reference adaptive systems	DM1	Explanation	Listens and Participates	Learn about model reference adaptive systems
26.	19-04-2016	Extended Kaman Filter	DM1	Explanation	Listens and participate	Understand speed estimation by Kaman filter
27.	20-04-2016	Extended Kaman Filter	DM1	Explanation	Listens and participate	Understand speed estimation by kalman filter
28.	21-04-2016	Injection of auxiliary signal on salient rotor.	DM1	Explanation	Listens and participate	Learn about injection of auxiliary signal on salient rotor to estimate the speed.
29.	21-04-2016	Seminar-6	DM2	Explanation	Listens and participate	
30.	22-04-2016	**UNITIII:CONTROLOF SYNCHRONOUS MOTOR DRIVES** Synchronous motor and its characteristics	DM1	Explanation	Listens and participate	Understand Synchronous motor and its characteristics
31.	3-05-2016	Synchronous motor and its characteristics	DM1	Explanation	Listens and participate	Understand Synchronous motor and its characteristics
32.	4-05-2016	Control strategies-Constant torque angle control power factor control	DM1	Explanation	Listens and participate	Analyze constant torque angel and power factor control
33.	5-05-2016	Control strategies-Constant torque angle control power factor control	DM1	Explanation	Listens and participate	Analyze constant torque angel and power factor control
34.	5-05-2016	constant flux control	DM1	Explanation	Listens and participate	Analyze constant flux control

35.	6-05-2016	Seminar-7	DM2	Explanation	Listens and participate	
36.	10-05-2016	MID-I	DM4			
37.	11-05-2016	flux weakening operation.	DM1	Explanation	Listens and Participate	Understand the flux weakening operation
38.	12-05-2016	Load commutated inverter fed synchronous motor drive	DM1	Explanation	Listens and participate	Application of synchronous motor drive
39.	12-05-2016	Load commutated inverter fed synchronous motor drive	DM1	Explanation	Listens and participate	Application of synchronous motor drive
40.	13-05-2016	motoring action of SM drive	DM1	Explanation	Listens and participate	Understand then motoring action of SM drive
41.	7-06-2016	Seminar-8	DM2	Explanation	Listens and participate	
42.	08-06-2016	motoring action of SM drive	DM1	Explanation	Listens and participate	Understand the motoring action
43.	09-06-2016	regeneration, phasor diagrams	DM1	Explanation	Listens and participate	Understand regeneration action
44.	09-06-2016	Regeneration action of SM	DM1	Explanation	Listens and participate	Understanding of regeneration action
45.	10-06-2016	phasor diagrams	DM1	Explanation	Listens and participate	analasys with the help of phasor diagrams
46.		Seminar-9				

	14-06-2016		DM2	Explanation	Listens and participate	
47.	15-06-2016	phasor diagrams	DM1	Explanation	Listens and participate	analasys with the help of phasor diagrams
48.	16-06-2016	**UNIT IV:CONTROL OF SWITCHED RELUCTANCE MOTOR** SRM-principle of operation	DM1	Explanation	Listens and participate	Understand the principal of operation
49.	16-06-2016	Design aspects of stator and rotor pole arcs, torque	DM1	Explanation	Listens and participate	Design aspects of stator and rotor pole arcs, torque
50.	17-06-2016	Design aspects of stator and rotor pole arcs, torque	DM1	Explanation	Listens and participate	Design aspects of stator and rotor pole arcs, torque
51.	21-06-2016	Seminar-10	DM2	Explanation	Listens and participate	
52.	22-06-2016	Design aspects of stator and rotor pole arcs, torque	DM1	Explanation	Listens and participate	Design aspects of stator and rotor pole arcs, torque
53.	23-06-2016	equation, torque-speed characteristics	DM1	Explanation	Listens and participate	Understand torque-speed characteristics
54.	23-06-2016	equation, torque-speed characteristics	DM1	Explanation	Listens and participate	Understand torque-speed characteristics
55.	24-06-2016	Stator Excitation-techniques of sensor less operation	DM1	Explanation	Listens and participate	Compare different techniques of sensor less operation
56.		Seminar-11				

	28-06-2016		DM2	Explanation	Listens and participate	
57.	29-06-2016	Stator Excitation-techniques of sensor less operation	DM1	Explanation	Listens and Participate	Compare different techniques of sensor less operation
58.	30-06-2016	convertor topologies- SRM Waveforms	DM1	Explanation	Listens and Participates	convertor topologies- SRM Waveforms
59.	30-06-2016	convertor topologies- SRM Waveforms	DM1	Explanation	Listens and participate	convertor topologies- SRM Waveforms
60.	1-07-2016	SRM drive design factors-Torque controlled SRM	DM1	Explanation	Listens and participate	Under stand of SRM drive design factors-Torque controlled SRM
61.	5-07-2016	Seminar-12	DM2	Explanation	Listens and participate	
62.	7-07-2016	SRM drive design factors-Torque controlled SRM	DM1	Explanation	Listens and participate	Under stand of SRM drive design factors-Torque controlled SRM
63.	7-07-2016	Torque Ripple	DM1	Explanation	Listens and participate	Learns about torque ripple
64.	8-07-2016	Instantaneous Torque control using current controllers	DM1	Explanation	Listens and participate	Study of Instantaneous Torque control using current controllers
65.			DM1	Explanation	Listens and	

	12-07-2016	**UNIT IV: CONTROL OF BLDC MOTOR DRIVES** Principle of operation of BLDC Machine.			participate	Understand the Principle of operation of BLDC Machine.
66.	13-07-2016	Seminar-13	DM2	Explanation	Listens and participate	
67.	14-07-2016	Principle of operation of BLDC Machine.	DM1	Explanation	Listens and participate	Understand the Principle of operation of BLDC Machine.
68.	14-07-2016	Sensing and logic switching scheme	DM1	Explanation	Listens and participate	Explain about Sensing and logic switching scheme
69.	15-07-2016	BLDM as Variable Speed Synchronous motor	DM1	Explanation	Listens and Participate	Application of BLDM
70.	19-07-2016	methods of reducing Torque pulsations	DM1	Explanation	Listens and participate	Learn different methods of torque reduction methods
71.	20-07-2016	Seminar-14	DM2	Explanation	Listens and participate	
72.	21-07-2016	Three-phase full wave Brushless dc motor	DM1	Explanation	Listens and Participates	Learn about Three-phase full wave Brushless dc motor
73.	21-07-2016	Three-phase full wave Brushless dc motor	DM1	Explanation	Listens and participate	Learn about Three-phase full wave Brushless dc motor
74.		MID-II	DM4			

NOTE: DELIVERY METHODS : **DM1**: Lecture interspersed with discussions/BB, **DM2:** Tutorial/Seminar, **DM3:** Lecture with a quiz, **DM4**: Assignment/Test, **DM5**: Demonstration (laboratory, field visit), **DM6**: Group Discussion, **DM7:** Group Assignment/ Project, **DM8:** Presentations/PPT, **DM9**:Asynchronous Discussion..

Signature				
	Name of the faculty	Name of the course Co-ordinator	Name of the Module Co-ordinator	HOD
	Mr. E.Raghu Babu	Mr.J.Siva Vara Prasad	Mr.J.Siva Vara Prasad	Dr. M.Uma Vani

CONTROL OF MOTOR DRIVES-II

Lecture : 4hrs/week
Tutorials : 1hrs/week
Subject code: MTEE202

Continuous Internal Assessment: 40
Semester End Examination: 60
Credits: 3

Prerequisites: Power Electronics, Electrical Machines

Course Objective:

The aim of this course is to study and understand the operation of electric drives controlled from a power electronic converter and to introduce the design concepts of controllers. Also this course enables the students to understand the steady state operation and transient dynamics of a motor load system.

Course Outcomes:

After completion of the course students will be able to:

CO1. Analyse the controlling methods of induction motor (abce)
CO2. Design and analyse control techniques of Permanent magnet synchronous motor (abce)
CO3. Analyse the controlling technique and Design of Switched reluctance motor (abcjei)

CO4. Design and analyse Brushless DC motor control (adcjei)

UNIT – I VECTOR CONTROL OF INDUCTION MOTOR

Principles of vector control, Direct vector control, derivation of indirect vector control, implementation – block diagram; estimation of flux, flux weakening operation

UNIT – II SENSORLESS VECTOR CONTROL OF INDUCTION MOTOR

Slip and Speed Estimation at low performance, Rotor Angle and Flux linkage Estimation at high performance -rotor Speed Estimation Scheme-estimators using rotor slot harmonics, Model Reference adaptive systems, Extended Kaman Filter, injection of auxiliary signal on salient rotor.

UNIT – III CONTROL OF SYNCHRONOUS MOTOR DRIVES

Synchronous motor and its characteristics- Control strategies-Constant torque angle control power factor control, constant flux control, flux weakening operation, Load commutated inverter fed synchronous motor drive, motoring and regeneration, phasor diagrams.

UNIT – IV CONTROL OF SWITCHED RELUCTANCE MOTOR DRIVES

SRM-principle of operation, Design aspects of stator and rotor pole arcs, torque equation, torque-speed characteristics-Stator Excitation-techniques of sensor less operation-convertor topologies- SRM Waveforms-SRM drive design factors-Torque controlled SRM-Torque Ripple- Instantaneous Torque control -using current controllers-flux controllers.

UNIT-V CONTROL OF BLDC MOTOR DRIVES

Principle of operation of BLDC Machine, Sensing and logic switching scheme, BLDM as Variable Speed Synchronous motor-methods of reducing Torque pulsations -Three-phase full wave Brushless dc motor -Sinusoidal type of Brushless dc motor - current controlled Brushless dc motor Servo drive.

TEXT BOOKS

1. R. Krishnan "Electric Motor Drives Modelling, Analysis & control", Pearson Education.

2. B. K. Bose "Modern Power Electronics and AC Drives", Pearson Publications.

REFERENCE BOOKS

3. MD Murphy & FG Turn Bull "Power Electronics control of AC motors", Pergman Press, 1st edition-1998.
4. G.K. Dubey "Fundamentals of Electrical Drives", Narosa Publications -1995.

5. Peter Vas "Sensor less Vector Direct Torque control", Oxford University Press.
6. Venkataratnam "Special electrical Machines", University press.

Mapping Table:

Course outcome	CMD-II										
	Programme out comes										
	a	b	c	d	e	f	g	h	i	j	k
CO1	√				√						
CO2	√			√	√			√		√	
CO3		√	√		√					√	
CO4	√	√	√		√				√	√	

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LESSON PLAN

Dt: 8-03-16

CLASS : M.Tech (PED)
Name of the faculty: T.Nagadurga **Semester: II** **A.Y: 2015-16**
Course Title: Modern Control Theory **Branch : EEE** Code : **MTEE204**

Lecture *No.*	Date as per Aca. Calendar / Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	**Remarks**
1	10-3-16	UNIT-I : **MODAL CONTROL**	DM1	Explanation	Listens and participate	INTRODUCTION to Modern Control Theory	
2	11-3-16	Introduction to controllability and observability	DM1	Explanation	Listens and participate	Analyze controllability and Observability	
3	14-3-16	Examples of Controllability	DM1	Explanation	Listens and participate	Analyze the different Examples of Controllability	
4	14-3-16	Examples of Observability	DM1	Explanation	Listens and participate	Analyze the different Examples of Observability	
5	15-3-16	Effect of state feedback on controllability	DM1	Explanation	Listens and participate	Discussion on the Effect of state feedback on controllability	

6	16-3-16	Effect of state feedback on Observability	DM1	Explanation	Listens and participate	Discussion on the Effect of state feedback on controllability	
7	17-3-16	Design of State Feedback Control through Pole placement	DM1	Explanation	Listens and participate	Understand the design concept	

Lecture *No.*	Date as per Aca. Calendar / Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	**Remarks**
8	18-316	Full order observer	DM1	Explanation	Listens and participate	Understand the design concept	
9	21-3-16	Reduced order observer	DM-1	Explanation	Listens and participate	Understand the design concept	
10	21-3-16	Problems on Controllability and Observability	DM1	Explanation	Listens and participate	Understand the problems on Controllability and observability	
11	22-3-16	Seminar- 1	DM-2	Facilitates	Listens and participate	Discussion on Controllability and Observability	
12	24-3-16	Problems	DM1	Explanation	Listens and participate	Understand the problems on Controllability	
13	28-3-16	Problems	DM1	Explanation	Listens and participate	Understand the problems on Observability	
14	28-3-16	Seminar-2	DM-2	Facilitates	Listens and Participates	Design the state feedback controller	

15	29-3-16	UNIT-II : **DESCRIBING FUNCTION ANALYSIS**	DM1	Explanation	Listens and participate	Introduction to describing function analysis	
16	30-3-16	Introduction to Non Linear Systems	DM1	Explanation	Listens and participate	Understand Non Linear Systems	
17	31-3-16	Behaviour of nonlinear systems	DM1	Explanation	Listens and participate	Understand Behaviour of nonlinear systems	
18	4-4-16	properties of Nonlinear Systems	DM1	Explanation	Listens and participate	Interpret the properties of Nonlinear Systems	
19	4-4-16	Types of Nonlinearities	DM1	Explanation	Listens and participate	Interpret Types of Nonlinearities	

Lecture *No.*	Date as per Aca. Calendar / Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	**Remarks**
20	5-4-16	Introduction to Linearization of nonlinear systems	DM1	Explanation	Listens and participate	Understand Non Linear Systems	
21	6-4-16	Describing function (DF)	DM1	Explanation	Listens and participate	Discussion on Describing function	
22	7-4-16	Derivation of general DF, DF for different nonlinearities	DM1	Explanation	Listens and Participates	Determination of DF of different nonlinearities	
23	11-4-16	Describing function of saturation and Deadzone Nonlinearity	DM1	Explanation	Listens and participate		

						Determination of DF of	
24	11-4-16	Describing function of saturation Nonlinearity	DM1	Explanation	Listens and participate	Determination of DF of saturation nonlinearity	
25	12-4-16	Describing function of Deadzone Nonlinearity	DM1	Explanation	Listens and participate	Determination of DF of Dead zone nonlinearity	
26	13-4-16	Describing function of backlash Nonlinearity	DM1	Explanation	Listens and participate	Determination of DF of backlash nonlinearity	
27	18-4-16	Seminar-3	DM-2	Facilitates	Listens and participate	Discussion on Describing function	
28	18-4-16	Describing function of Hysteresis-Backlash Nonlinearity	DM1	Explanation	Listens and Participates	Determination of DF of Hysteresis-Backlash Nonlinearity	
29	19-4-16	Describing function of Hysteresis Nonlinearity	DM1	Explanation	Listens and participate	Determination of DF of Hysteresis Nonlinearity	
30	20-4-16	Seminar-4	DM-2	Facilitates	Listens and participate	Discussion on properties of Nonlinear Systems	
31	21-4-16	Stability analysis of Non – Linear systems through describing functions	DM1	Explanation	Listens and participate	Discussion on Stability analysis of Non – Linear systems	

Lecture *No.*	Date as per Aca. Calendar / Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	***Remarks***
32	25-4-16	Problems	DM1	Explanation	Listens and	Understand the problems on DF	

					participate		
33	25-4-16	problems	DM1	Explanation	Listens and participate	Understand the problems on DF	
34	26-4-16	UNIT-III : **PHASE PLANE ANALYSIS**	DM1	Explanation	Listens and participate	Introduction to phase plane analysis	
35	27-4-16	Introduction to phase plane analysis	DM1	Explanation	Listens and participate	Introduction to phase plane analysis	
36	28-4-16	Singular points, and their classification	DM1	Explanation	Listens and participate	Discussion about singular points	
37	2-5-16	Limit cycle and behaviour of limit cycle	DM1	Explanation	Listens and participate	Discussion about limit cycles	
38	2-5-16	Analytical method for constructing Trajectories	DM1	Explanation	Listens and participate	Understand the Analytical method	
39	3-5-16	Seminar-5	DM-2	Facilitates	Listens and participate	Discussion on construction of Phase trajectories	
40	4-5-16	Isoclines method for constructing Trajectories	DM1	Explanation	Listens and Participates	Understand the Isoclines method	
41	5-5-16	Isoclines method for constructing Trajectories	DM1	Explanation	Listens and participate	Understand the Isoclines method	
42	9-5-16	Delta method for constructing Trajectories	DM1	Explanation	Listens and participate	Understand the Delta method	
43	9-5-16	Delta method for constructing Trajectories	DM1	Explanation	Listens and participate	Understand the Delta method	

Lecture *No.*	Date as per Aca. Calendar Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	***Remarks***
44	10-5-16	Seminar-6	DM-2	Facilitates	Listens and participate	Analyse the methods for constructing Trajectories	
45	11-5-16	Phase plane analysis of nonlinear control systems.	DM1	Explanation	Listens and Participates	Discussion on Phase plane analysis of nonlinear control systems.	
46	12-5-16	Phase plane analysis of nonlinear control systems.	DM1	Explanation	Listens and participate	Discussion on Phase plane analysis of nonlinear control systems.	
47	6-6-16	problems	DM1	Explanation	Listens and participate	Understand the problems on phase plane analysis	
48	6-6-16	problems	DM1	Explanation	Listens and participate	Understand the problems on phase plane analysis	
49	7-6-16	problems	DM1	Explanation	Listens and participate	Understand the problems on phase plane analysis	
50	8-6-16	UNIT-IV : **STABILITY ANALYSIS**	DM1	Explanation	Listens and participate	Introduction	
51	9-6-16	Introduction to stability	DM1	Explanation	Listens and participate	Understand the stability	
52	13-6-16	Stability of equilibrium state	DM1	Explanation	Listens and	Discussion on equilibrium state	

					participate		
53	13-6-16	Asymptotic stability	DM1	Explanation	Listens and participate	Understand Asymptotic stability	
54	14-6-16	Graphical representation	DM1	Explanation	Listens and participate	Analyse the Graphical representation of stability	

Lecture *No.*	Date as per Aca. Calendar / Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	***Remarks***
55	15-6-16	Lyapunov stability theorem	DM1	Explanation	Listens and Participates	Understand Lyapunov stability theorem	
56	16-6-16	Lyapunov stability theorem	DM1	Explanation	Listens and participate	Understand Lyapunov stability theorem	
57	20-6-16	Stability analysis of linear and nonlinear systems	DM1	Explanation	Listens and participate	Discussion on Stability analysis of linear and nonlinear systems	
58	20-6-16	Seminar-7	DM-2	Facilitates	Listens and participate	Analyse Lyapunov stability theorem	
59	21-6-16	Stability analysis of linear and nonlinear systems	DM1	Explanation	Listens and participate	Discussion on Stability analysis of linear and nonlinear systems	
60	22-6-16	Construction of Lyapunov functions using Krasovskii method	DM1	Explanation	Listens and participate	Understand Krasovskii method	
61	25-6-16		DM1		Listens and		

		Construction of Lyapunov functions using variable gradient		Explanation	participate	Understand variable gradient method	
62	27-6-16	Stability analysis of linear and nonlinear systems	DM1	Explanation	Listens and participate	Discussion on Stability analysis of linear and nonlinear systems	
63	27-6-16	Seminar-8	DM-2	Facilitates	Listens and Participates	Interprets the methods for Construction of Lyapunov functions	
64	28-6-16	problems	DM1	Explanation	Listens and participate	Understand the problems on stability analysis	
65	29-6-16	problems	DM1	Explanation	Listens and participate	Understand the problems on stability analysis	
66	30-6-16	problems	DM1	Explanation	Listens and participate	Understand the problems on stability analysis	
Lecture *No.*	Date as per Aca. Calendar / Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	***Remarks***
67	4-7-16	UNIT-V : **OPTIMAL CONTROL**	DM1	Explanation	Listens and participate	Introduction	
68	4-7-16	Introduction of optimal control problems	DM1	Explanation	Listens and participate	Understand optimal control problems	
69	5-7-16	Formulation of optimal control problems	DM1	Explanation	Listens and participate	Formulation of optimal control problems	
70	7-7-16	Minimum time, Minimum energy,	DM1	Explanation	Listens and participate	Discussion on Minimum time, Minimum energy	
71	11-7-16		DM1	Explanation	Listens and		

		Minimum fuel problems			participate	Discussion on Minimum fuel problems	
72	11-7-16	Seminar-9	DM-2	Facilitates	Listens and participate	Discussion on Optimal Control	
73	12-7-16	State regulator problem	DM1	Explanation	Listens and Participates	Discussion on State regulator problem	
74	13-7-16	Output regulator problem	DM1	Explanation	Listens and participate	Discussion on Output regulator problem	
75	14-7-16	Tracking problem, calculus of variations	DM1	Explanation	Listens and participate	Discussion on Tracking problem, calculus of variations	
76	18-7-16	fundamental concepts	DM1	Explanation	Listens and participate	Discussion on fundamental concepts	
77	17-7-16	minimization of function	DM1	Explanation	Listens and participate	Understand the minimization of function	
78	19-7-16	Seminar-10	DM2	Facilitates	Listens and participate	Discussion on Linear quadratic regulator	
79	20-7-16	Linear quadratic regulator	DM-1	Explanation	Listens and Participates	Understand the design	
80	21-7-16	Linear Quadratic Gaussian(LQG)	DM-1	Explanation	Listens and Participates	Understand the design	

NOTE: DELIVERY METHODS: **DM1**: Lecture interspersed with discussions/BB, **DM2:** Tutorial, **DM3:** Lecture with a quiz, **DM4**: Assignment/Test, **DM5**: Demonstration (laboratory, field visit), **DM6**: Group Discussion, **DM7:** Group Assignment/ Project, **DM8:** Presentations/PPT, **DM9**:Asynchronous Discussion..

Signature				
	Name of the faculty	Name of the course Co-ordinator	Name of the Module Co-ordinator	HOD
	T.nagadurga			

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LESSON PLAN

Dt: 08-03-16

CLASS : M.Tech (PED)
Name of the faculty: N.V.Subba Rao **Semester: II** **A.Y: 2015-16**
Course Title: POWER QUALITY **Branch : EEE** Code : **MTEE2051**

Lecture *No.*	Date as per Aca. Calendar / Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	**Remarks**
1	10-3-16	UNIT-I : **OVERVIEW OF POWER QUALITY**	DM1	Explanation	Listens and participate	INTRODUCTION to PQ	
2	11-3-16	Power quality (PQ) problem	DM1	Explanation	Listens and participate	Understand PQ problems	
3	14-3-16	Voltage sag, Swell	DM1	Explanation	Listens and participate	Interprets the Voltage sags & swells	
4	14-3-16	Surges, Harmonics	DM1	Explanation	Listens and participate	Understand surges & harmonics	
5	15-3-16	Over voltages	DM1	Explanation	Listens and participate	Discuss on Over voltages	
6	16-3-16	Spikes	DM1	Explanation	Listens and		

					participate	Understand the concept on	
7	17-3-16	Voltage fluctuations	DM1	Explanation	Listens and participate	Understand the fluctuations	

Lecture *No.*	Date as per Aca. Calendar / Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	**Remarks**
8	18-316	Transients	DM1	Explanation	Listens and participate	Interprets the types of transients	
9	21-3-16	**SEMINAR-I**	DM-2	Facilitates	Listens and Participates	Discuss on PQ terms	
10	21-3-16	Interruption	DM1	Explanation	Listens and participate	Understand causes for failure of power.	
11	22-3-16	Overview of power quality phenomenon	DM1	Explanation	Listens and participate	Understand the PQ concepts	
12	24-3-16	Remedies to improve power quality	DM1	Explanation	Listens and participate	Interprets types of remedies for PQ improvement	
13	28-3-16	Power quality monitoring	DM1	Explanation	Listens and participate	Discuss on PQ monitoring	
14	28-3-16	**SEMINAR -II**	DM-2	Facilitates	Listens and Participates	Discuss on POWER QUALITY STANDARDS	
15	29-3-16	UNIT-II :	DM1	Explanation	Listens and		

		VOLTAGE SAGS AND INTERRUPTIONS			participate	Introduction about sags and	
16	30-3-16	Sources of sags	DM1	Explanation	Listens and participate	Understand reasons for voltage sags	
17	31-3-16	Sources of interruptions	DM1	Explanation	Listens and participate	Understand reasons for Interruptions	
18	4-4-16	Estimating Voltage sag performance	DM1	Explanation	Listens and participate	Discuss on Area vulnerability & sensitivity of equipments	
19	4-4-16	Estimating Voltage sag performance	DM1	Explanation	Listens and participate	Understand Transmission system & utility system performance	

Lecture *No.*	Date as per Aca. Calendar / Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	**Remarks**
20	5-4-16	Fundamental principles of protection	DM1	Explanation	Listens and participate	Understand Protection Principles	
21	6-4-16	Solutions at the End-User level	DM1	Explanation	Listens and participate	Interprets the Solutions to improve the reliability and performance	
22	7-4-16	**SEMINAR -III**	DM-2	Facilitates	Listens and Participates	Remedies to improve PQ	
23	11-4-16	Solutions at the End-User level	DM1	Explanation	Listens and participate	Interprets the Solutions to improve the reliability and performance	

24	11-4-16	Evaluating the economics of different ride-through alternatives	DM1	Explanation	Listens and participate	Understand the economic evaluation procedure	
25	12-4-16	Motor-starting sags	DM1	Explanation	Listens and participate	Discuss on Motor starting methods	
26	13-4-16	Utility system fault-clearing issues	DM1	Explanation	Listens and participate	Understand the utilities to reduce the severity of faults	
27	18-4-16	Utility system fault-clearing issues	DM1	Explanation	Listens and participate	Understand the utilities to reduce the severity of faults	
28	18-4-16	**SEMINAR -IV**	DM-2	Facilitates	Listens and Participates	COSTS for PQ improvement	
29	19-4-16	UNIT-III **HARMONICS**	DM1	Explanation	Listens and participate	Introduction to Harmonics	
30	20-4-16	Harmonic Distortion	DM1	Explanation	Listens and participate	Understand the effects by non-linear devices	
31	21-4-16	Voltage versus current distortion	DM1	Explanation	Listens and participate	Interprets Voltage Vs current Distortion	

Lecture *No.*	Date as per Aca. Calendar / Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	***Remarks***
32	25-4-16	Harmonic versus Transients	DM1	Explanation	Listens and participate	Interprets harmonics Vs Transients	
33	25-4-16		DM1	Explanation	Listens and		

		Power system Quantities under non sinusoidal conditions			participate	Understand the different quantities under non sinusoidal	
34	26-4-16	Harmonic indices	DM1	Explanation	Listens and participate	Interprets the measurements of harmonic content	
35	27-4-16	Harmonic sources from commercial loads	DM1	Explanation	Listens and participate	Understand the sources of harmonics(commercial)	
36	28-4-16	Harmonic sources from industrial loads	DM1	Explanation	Listens and participate	Understand the sources of harmonics(industrial)	
37	2-5-16	Locating harmonic sources	DM1	Explanation	Listens and participate	Understand the location of power system equipment	
38	2-5-16	System response characteristics	DM1	Explanation	Listens and participate	Interprets the different variables to affect system response	
39	3-5-16	Effects of harmonic distortion	DM1	Explanation	Listens and participate	Discuss the effects of Harmonic distortion	
40	4-5-16	**SEMINAR -V**	DM-2	Facilitates	Listens and Participates	Effects of Harmonics	
41	5-5-16	Inter harmonics	DM1	Explanation	Listens and participate	Understand the effect of inter-harmonics	
42	9-5-16	Harmonic Distortion Evaluation	DM1	Explanation	Listens and participate	Understand the evaluation of harmonic distortion	
43	9-5-16	Principles of Controlling Harmonics	DM1	Explanation	Listens and participate	Understand the options for Controlling Harmonics	

Lecture *No.*	Date as per Aca. Calendar / Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	***Remarks***
44	10-5-16	Harmonic studies	DM1	Explanation	Listens and participate	Understand Harmonic study procedure	
45	11-5-16	**SEMINAR -VI**	DM-2	Facilitates	Listens and Participates	Methods to reduce harmonics	
46	12-5-16	Devices for controlling Harmonics	DM1	Explanation	Listens and participate	Interprets the devices for Controlling Harmonics	
47	6-6-16	Harmonic filter Design	DM1	Explanation	Listens and participate	Understand the design of harmonic filters	
48	6-6-16	**UNIT-IV** **POWER QUALITY MONITORING**	DM1	Explanation	Listens and participate	Introduction to PQ monitoring	
49	7-6-16	Monitoring considerations	DM1	Explanation	Listens and participate	Understand the objectives of PQ monitoring	
50	8-6-16	Monitoring considerations	DM1	Explanation	Listens and participate	Discuss the objectives of PQ monitoring	
51	9-6-16	Historical perspective of power quality measuring instruments	DM1	Explanation	Listens and participate	Understand the development of PQ measurements	
52	13-6-16	Power quality measurement equipment	DM1	Explanation	Listens and participate	Interprets the types of instruments for PQ measurement	
53	13-6-16	Power quality measurement equipment	DM1	Explanation	Listens and participate	Interprets the types of instruments for PQ measurement	

54	14-6-16 	Power quality measurement equipment	DM1	Explanation	Listens and participate	Interprets the types of instruments for PQ measurement	

Lecture *No.*	Date as per Aca. Calendar Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	***Remarks***
55	15-6-16 	**SEMINAR -VII**	DM-2	Facilitates	Listens and Participates	Importance of PQ monitoring	
56	16-6-16 	Assessment of power quality measurement data	DM1	Explanation	Listens and participate	Understand OFF-line PQ data analysis	
57	20-6-16 	Assessment of power quality measurement data	DM1	Explanation	Listens and participate	Understand ON-line PQ data analysis	
58	20-6-16 	Application of intelligent systems	DM1	Explanation	Listens and participate	Understand the types of applications of systems	
59	21-6-16 	Application of intelligent systems	DM1	Explanation	Listens and participate	Understand the types of applications of systems	
60	22-6-16 	Application of intelligent systems	DM1	Explanation	Listens and participate	Understand the types of applications of systems	
61	25-6-16 	Power quality monitoring standards	DM1	Explanation	Listens and participate	Understand IEEE standards for Power quality monitoring	
62	27-6-16 	Power quality monitoring standards	DM1	Explanation	Listens and participate	Understand IEC standards for Power quality monitoring	
63	27-6-16	**SEMINAR -VIII**		Facilitates	Listens and	PQ measurement	

			DM-2		Participates		
64	28-6-16	**UNIT-V** **POWER QUALITY BENCHMARKING**	DM1	Explanation	Listens and participate	Introduction to PQ Bench-marking	
65	29-6-16	Benchmarking process	DM1	Explanation	Listens and participate	Understand the steps in Benchmarking process	
66	30-6-16	Power quality contracts	DM1	Explanation	Listens and participate	Understand contractual agreements of PQ	

Lecture *No.*	Date as per Aca. Calendar Actual Date	***Content***	***Teaching Methodology***	***Faculty Approach***	***Student approach***	***Learning outcome***	***Remarks***
67	4-7-16	Power quality insurance	DM1	Explanation	Listens and participate	Understand Power quality insurance policy	
68	4-7-16	Power quality state estimation	DM1	Explanation	Listens and participate	Discuss PQ state estimation	
69	5-7-16	Power quality in distribution planning	DM1	Explanation	Listens and participate	Understand the PQ planning process	
70	7-7-16	Power quality in distribution planning	DM1	Explanation	Listens and participate	Understand the PQ planning process	
71	11-7-16	Wiring and Grounding	DM1	Explanation	Listens and participate	Introduction	
72	11-7-16	Definitions and resources	DM1	Explanation	Listens and		

					participate	Discuss different definitions regarding Wiring and Grounding	
73	12-7-16	**SEMINAR -IX**	DM-2	Facilitates	Listens and Participates	Importance of Benchmarking Process	
74	13-7-16	Reasons for grounding	DM1	Explanation	Listens and participate	Understand the reasons for grounding	
75	14-7-16	Reasons for grounding	DM1	Explanation	Listens and participate	Understand the reasons for grounding	
76	18-7-16	Typical wiring and grounding problems	DM1	Explanation	Listens and participate	Understand the problems associated with wiring and grounding	
77	17-7-16	Solutions to wiring and grounding problems	DM1	Explanation	Listens and participate	Interprets the solutions to wiring and grounding problems	
78	19-7-16	Solutions to wiring and grounding problems	DM1	Explanation	Listens and participate	Interprets the solutions to wiring and grounding problems	
79	20-7-16	**SEMINAR -X**	DM-2	Facilitates	Listens and Participates	Advantages of Wiring and grounding	
	21-7-16						

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Signature				
	Name of the faculty	Name of the course Co-ordinator	Name of the Module Co-ordinator	HOD
	N.V.Subba Rao			

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Lesson Plan format **Dt:08-03-2016**

Name of the faculty: **K.R.L.Prasad & J.Sivavara Prasad** **Semester:II** **A.Y:2015-16**

Course Title: **SWICHMODE POWER CONVERSION**

Lecture *No.*	Date as per Aca. Calendar	*Content*	*Teaching Methodology*	*Faculty Approach*	*Student approach*	*Learning outcome*	*Remarks*
1.	8-03-2016	UNITI: NON ISOLATED SWICHMODE POWER CONVERSION	DM1	Explanation	Listens and participate	Understand ISOLATED SWICHMODE POWER CONVERSION	
2.	9-03-2016	Analysis of Buck converter, CCM,DCM	DM1	Explanation	Listens and participate	Analyze of Buck converter, CCM,DCM	
3.	10-03-2016	Designing of Buck converter, CCM,DCM	DM1	Explanation	Listens and participate	Design of Buck converter, CCM,DCM	
4.	10-03-2016	Analysis of Boost converter, CCM,DCM	DM1	Explanation	Listens and participate	Analyze of Boost converter, CCM,DCM	
5.	11-03-2016	Designing of Boost converter, CCM,DCM	DM1	Explanation	Listens and participate	Design of Boost converter, CCM,DCM	
6.	15-03-2016	Analysis of Buck-Boost converter, CCM,DCM	DM1	Explanation	Listens and participate	Analyze of Buck-Boost converter, CCM,DCM	
7.	16-03-2016	seminar-1	DM2	Explanation	Listens and Participate		
8.	17-03-2016	Designing of Buck-Boost converter, CCM,DCM	DM1	Explanation	Listens and		

					participate	Design of Buck-Boost converter, CCM,DCM	
9.	17-03-2016	Analysis of Cuk converter, CCM,DCM	DM1	Explanation	Listens and Participates	Analyze of Cuk converter, CCM,DCM	
10.	18-03-2016	Designing of Cuk converter, CCM,DCM	DM1	Explanation	Listens and participate	Design of Cuk converter, CCM,DCM	
11.	22-03-2016	applications, problems	DM1	Explanation	Listens and participate	Understand applications	
12.	23-03-2016	seminar-2	DM2	Explanation	Listens and participate		
13.	24-03-2016	problems	DM1	Explanation	Listens and participate	Solving problems	
14.	24-03-2016	UNITII: ISOLATED SWICHMODE POWER CONVERSION	DM1	Explanation	Listens and participate	Understand ISOLATED SWICHMODE POWER CONVERSION	
15.	29-03-2016	Requirement for isolation in the switch-mode converters, transformer connection	DM1	Explanation	Listens and participate	Understand Requirement for isolation in the switch-mode converters, transformer connection	
16.	30-03-2016	Forward converter, power circuit and steady state analysis-Applications.	DM1	Explanation	Listens and participate	Understand Forward converter, power circuit and steady state analysis-Applications.	
17.	31-03-2016	seminar-3	DM2	Explanation	Listens and participate		
18.	31-03-2016	fly back converter, power circuit and steady state analysis-Applications.	DM1	Explanation	Listens and participate	Understand fly back converter, power circuit and steady state analysis-Applications.	
19.	1-04-2016	Push Pull Converters: Power circuit and steady state analysis	DM1	Explanation	Listens and participate	Understand Push Pull Converters: Power circuit and steady state analysis	

20.	5-04-2016	utilization of magnetic circuits in single switch and push-pull topologies	DM1	Explanation	Listens and Participate	Explains utilization of magnetic circuits in single switch and push-pull topologies	
21.	6-04-2016	Applications	DM1	Explanation	Listens and participate	Explains Applications	
22.	7-04-2016	seminar-4	DM2	Explanation	Listens and Participates		
23.	7-04-2016	full bridge converter- Power circuit and steady state analysis	DM1	Explanation	Listens and participate	Understand full bridge converter-Power circuit and steady state analysis	
24.	12-04-2016	Half bridge converter- Power circuit and steady state analysis	DM1	Explanation	Listens and participate	Understand Half bridge converter-Power circuit and steady state analysis	
25.	13-04-2016	Utilization of magnetic circuits	DM1	Explanation	Listens and participate	Explains Utilization of magnetic circuits	
26.	19-04-2016	comparison with previous topologies	DM1	Explanation	Listens and participate	Explains comparison with previous topologies	
27.	20-04-2016	seminar-5	DM2	Explanation	Listens and participate		
28.	21-04-2016	Applications	DM1	Explanation	Listens and participate	Explains Applications	
29.	21-04-2016	Problems	DM1	Explanation	Listens and participate	Solving problems	
30.	22-04-2016	Problems	DM1	Explanation	Listens and participate	Solving problems	
31.	3-05-2016	UNIT III: SOFT SWITCHING CONVERTERS	DM1	Explanation	Listens and participate	Understand SOFT SWITCHING CONVERTERS	
32.	4-05-2016	Classification of Resonant converters-Basic resonant circuits	DM1	Explanation	Listens and participate	Explains Classification of Resonant converters-Basic resonant circuits	
33.	5-05-2016	Series resonant circuit	DM1	Explanation	Listens and participate	Explains Series resonant circuit	
34.	5-05-2016	Parallel resonant circuits	DM1	Explanation	Listens and participate	Explains Parallel resonant circuits	

35.	6-05-2016	seminar-7	DM2	Explanation	Listens and participate		
36.	10-05-2016	Resonant switches, Concept of Zero voltage switching	DM1	Explanation	Listens and participate	Understand Concept of Zero voltage switching	
37.	11-05-2016	Principle of operation, analysis of M-type Buck Converter	DM1	Explanation	Listens and participate	Understand Principle of operation, analysis of M-type Buck Converter	
38.	12-05-2016	Principle of operation, analysis of L-type Buck Converter	DM1	Explanation	Listens and participate	Understand Principle of operation, analysis of L-type Buck Converter	
39.	12-05-2016	Principle of operation, analysis of M-type Boost Converter	DM1	Explanation	Listens and Participate	Understand Principle of operation, analysis of M-type Boost Converter	
40.	13-05-2016	seminar-8	DM2	Explanation	Listens and participate		
41.	7-06-2016	Principle of operation, analysis of L-type Boost Converter	DM1	Explanation	Listens and Participates	Understand Principle of operation, analysis of L-type Boost Converter	
42.	08-06-2016	Concept of Zero current switching	DM1	Explanation	Listens and participate	Understand Concept of Zero current switching	
43.	09-06-2016	Principle of operation, analysis of M-type Buck Converter	DM1	Explanation	Listens and participate	Understand Principle of operation, analysis of M-type Buck Converter	
44.	09-06-2016	Principle of operation, analysis of L-type Buck Converter	DM1	Explanation	Listens and participate	Understand Principle of operation, analysis of L-type Buck Converter	
45.	10-06-2016	seminar-9	DM2	Explanation	Listens and participate		
46.	14-06-2016	Principle of operation, analysis of M-type Boost Converter	DM1	Explanation	Listens and participate	Understand Principle of operation, analysis of M-type Boost Converter	

47.	15-06-2016	Principle of operation, analysis of L-type Boost Converter	DM1	Explanation	Listens and participate	Understand Principle of operation, analysis of L-type Boost Converter	
48.	16-06-2016	UNIT IV: POWER FACTOR CORRECTION CIRCUITS	DM1	Explanation	Listens and participate	Understand POWER FACTOR CORRECTION CIRCUITS	
49.	16-06-2016	Introduction, Definition of PF and THD, Power Factor Correction	DM1	Explanation	Listens and participate	Learns Definition of PF and THD, Power Factor Correction	
50.	17-06-2016	seminar-10	DM2	Explanation	Listens and participate		
51.	21-06-2016	Energy Balance in PFC Circuits	DM1	Explanation	Listens and participate	Explains Energy Balance in PFC Circuits	
52.	22-06-2016	Passive Power Factor Corrector	DM1	Explanation	Listens and Participate	Understand Passive Power Factor Corrector	
53.	23-06-2016	Basic Circuit Topologies of Active Power Factor Correctors	DM1	Explanation	Listens and participate	Understand Basic Circuit Topologies of Active Power Factor Correctors	
54.	23-06-2016	System Configurations of PFC Power Supply	DM1	Explanation	Listens and Participates	Understand System Configurations of PFC Power Supply	
55.	24-06-2016	seminar-11	DM2	Explanation	Listens and participate		
56.	28-06-2016	CCM Shaping Technique	DM1	Explanation	Listens and participate	Understand CCM Shaping Technique	
57.	29-06-2016	Current Mode Control	DM1	Explanation	Listens and participate	Understand Current Mode Control	
58.	30-06-2016	Voltage Mode Control	DM1	Explanation	Listens and participate	Understand Voltage Mode Control	
59.	30-06-2016	Other PFC Techniques	DM1	Explanation	Listens and participate	Explains Other PFC Techniques	
60.	1-07-2016	seminar-12	DM2	Explanation	Listens and participate		
61.	5-07-2016		DM1	Explanation			

		UNIT V: CONTROL METHODS FOR SWITCHING POWER CONVERTERS			Listens and participate	Understand CONTROL METHODS FOR SWITCHING POWER CONVERTERS	
62.	7-07-2016	Control methods for buck dc-dc converters using State-space Modelling	DM1	Explanation	Listens and participate	Understand Control methods for buck dc-dc converters using State-space Modeling	
63.	7-07-2016	Control methods for boost dc-dc converters using State-space Modeling	DM1	Explanation	Listens and participate	Understand Control methods for boost dc-dc converters using State-space Modeling	
64.	8-07-2016	Control methods for forward dc-dc converters using State-space Modeling	DM1	Explanation	Listens and participate	Understand Control methods for forward dc-dc converters using State-space Modeling	
65.	12-07-2016	seminar-13	DM2	Explanation	Listens and Participate		
66.	13-07-2016	Converter Transfer Functions of buck dc-dc converter	DM1	Explanation	Listens and participate	Derive Converter Transfer Functions of buck dc-dc converter	
67.	14-07-2016	Converter Transfer Functions of boost dc-dc converter	DM1	Explanation	Listens and Participates	Derive Converter Transfer Functions of boost dc-dc converter	
68.	14-07-2016	Converter Transfer Functions of forward dc-dc converter	DM1	Explanation	Listens and participate	Derive Converter Transfer Functions of forward dc-dc converter	
69.	15-07-2016	Pulse Width Modulator Transfer Functions	DM1	Explanation	Listens and participate	Understand Pulse Width Modulator Transfer Functions	
70.	19-07-2016	Pulse Width Modulator Transfer Functions	DM1	Explanation	Listens and participate	Understand Pulse Width Modulator Transfer Functions	
71.	20-07-2016	Linear Feedback Design Ensuring Stability	DM1	Explanation	Listens and participate	Understand Linear Feedback Design Ensuring Stability	
72.	21-07-2016	Linear Feedback Design Ensuring Stability	DM1	Explanation	Listens and participate	Understand Linear Feedback Design Ensuring Stability	

73.	21-07-2016	repetition of unit3	DM8	Explanation	Listens and participate		
74.	22-07-2016	repetition of unit4 & 5	DM8	Explanation	Listens and participate		

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