# K L University

(Koneru Lakshmaiah Education Foundation)
Deemed to be University Estd. u/s 3 of UGC Act. 1956

Accredited by NAAC as 'A' Grade University \* Approved by AICTE \* ISO 9001-2008 Certified Green Fields, Vaddeswaram, Guntur District, Pincode: 522 502, Andhra Pradesh., INDIA
Phones: 0863-2399999 FAX: 0863-2388999

Date: 03.05.2015

## **BOARD OF STUDIES INVITATION**

Electrical & Electronics Engineering Department Board of Studies meeting is scheduled on 04.05.2015 at 10.30 AM in E104. All the BOS Members are requested to make it convenient to attend the meeting.

## Agenda of the Meeting:

- 1. To consider the proposed 2015-16 admitted batch B.Tech Curriculum and make recommendations to the Academic council KLU for approval the same.
- 2. To consider the proposed 2015-16 admitted batch M.Tech (PED & PS) Curriculum and make recommendations to the Academic council KLU for approval the same.

### Following are the members present:

- 1. Dr. O. Chandra Sekhar, Professor & Head, EEE Department, K L University
- 2. Dr. P. Linga Reddy, Professor, EEE Department, K L University
- 3. Dr. G. Kesava Rao, Professor, EEE Department, K L University
- 4. Dr.M.K.S.Sastry, Visiting Professor, EEE Department, KL University
- 5. Dr. K. Subba Rao, Professor, EEE Department, K L University
- 6. Dr. S.V.N.L.Lalitha, Professor, EEE Department, K L University
- 7. Dr.Y.P.Obulesu, Professor, EEE Department, K L University
- 8. Dr.S.Lakshminarayana, Professor, ECE Department, K L University
- 9. Dr.K.Harinath Reddy, Professor, EEE Department, K L University
- 10. Dr. K.S.Srikanth, Professor, EEE Department, K L University
- 11. Dr. A. Pandian, Professor, EEE Department, K L University
- 12. Dr. P.S. Varma, Associate Professor, EEE Department, K L University
- 13. Dr. M. Kiran Kumar, Associate Professor, EEE Department, K L University
- 14. Dr.D.Sudha Rani, Assistant Professor, EEE Department, K L University
- 15. Mr. K. Narasimha Raju, Associate Professor, EEE Department, K L University
- 16. Mr. D. Narasimha Rao, Associate Professor, EEE Department ,K L University
- 17. Mr.A.Appa Rao, Associate Professor, EEE Department, K L University
- 18. Mr. D. Seshi Reddy, Associate Professor, EEE Department ,K L University
- 19. Mr. J. Somlal, Associate Professor, EEE Department, K L University
- 20. Mr. R.B.R. Prakash, Associate Professor, EEE Department ,K L University
- 21. Mrs. K Sarada, Associate Professor, EEE Department K L University

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Date: 04.05.2015

### MINUTES OF BOARD OF STUDIES MEETING

The following are the Minutes discussed in the "Board of Studies" meeting held on 04.05.2015 at 10.30 AM in HOD –EEE chamber.

### Agenda of the Meeting:

- 1. To consider the proposed 2015-16 admitted batch B.Tech Curriculum and make recommendations to the Academic council KLU for approval the same.
- 2. To consider the proposed 2015-16 admitted batch M.Tech Curriculum and make recommendations to the Academic council KLU for approval the same.
- 3. Any other points with permission of the chair.

### The following members are present:

- 1. Dr. O. Chandra Sekhar, Professor & Head, EEE Department, K L University
- 2. Dr. P. Linga Reddy, Professor, EEE Department, K L University
- 3. Dr. G. Kesava Rao, Professor, EEE Department, K L University
- 4. Dr.M.K.S.Sastry, Visiting Professor, EEE Department, KL University
- 5. Dr. K. Subba Rao, Professor, EEE Department, K L University
- 6. Dr. S.V.N.L.Lalitha, Professor, EEE Department, K L University
- 7. Dr.Y.P.Obulesu, Professor, EEE Department, K L University
- 8. Dr.S.Lakshminarayana, Professor, ECE Department, K L University
- 9. Dr.K.Harinath Reddy, Professor, EEE Department, K L University
- 10. Dr. K.S.Srikanth, Professor, EEE Department, K L University
- 11. Dr. A. Pandian, Professor, EEE Department, K L University
- 12. Dr. P.S. Varma, Associate Professor, EEE Department, K L University
- 13. Dr. M. Kiran Kumar, Associate Professor, EEE Department, K University
- 14. Dr.D.Sudha Rani, Assistant Professor, EEE Department, K L University
- 15. Mr. K. Narasimha Raju, Associate Professor, EEE Department, K L University
- 16. Mr. D. Narasimha Rao, Associate Professor, EEE Department K L University
- 17. Mr.A.Appa Rao, Associate Professor, EEE Department, K L University
- 18. Mr. D. Seshi Reddy, Associate Professor, EEE Department ,K University
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The following External Members gave their valuable suggestions

- 1. Dr.D.V.S.Siva Sharma, Professor, EEE Department, NIT Warangal
- 2. Dr.C.Nagamani, Professor, EEE Department, NIT Tiruchy

Dr.O.Chandra Sekhar welcomed the BOS Members for the "Board of Studies Meeting". The Chairman discussed about the previous BOS meeting resolutions and amendments made to the curriculum which are approved in Academic Council.

The Board of studies of the Department of Electrical & Electronics Engineering made the following resolutions:

- 1. Dr.O.Chandra Sekhar proposed PBL (Project Based Laboratory) concept to be implemented to all the courses of B.Tech students admitted in the 2015-16.
- 2. The amendment put forward by Dr.O.Chandra Sekhar approved by board unanimously.
- 3. Dr.A.Pandian, PED Research Group head put forward the modifications in the syllabus of Power Electronics & Drives specialisation courses offered for 2015-16 Batch.
- 4. Dr.P.S.Varma, PS Research Group head put forward the modifications in the syllabus of Power Systems specialisation courses offered for 2015-16 Batch.
- 5. Dr.Y.P.Obulesu, proposed Hybrid Electric Vehicles as a course to the B.Tech students.
- 6. The amendment put forward by Dr.Y.P.Obulesu, approved by board as a professional elective course.
- 7. Dr.C.Nagamani, proposed Utilisation of Electrical Energy as a course to the B.Tech students.
- 8. The amendment put forward by Dr.C.Nagamani, approved by board as a professional elective course.
- 9. As per the feedback from Alumni & Students, Dr.O.Chandra Sekhar approved Two communication skills courses (Verbal communication & Corporate communication skills) are added to the Curriculum for improving placement opportunities.

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- 10. The revised curriculum structure for 2015-16 Admitted B.Tech batch was approved by all members present in the meeting. The detailed structure of 2016-17 was shown in Annexure 1.
- 11. The revised curriculum structure for 2015-16 Admitted M.Tech batch was approved by all members present in the meeting. The detailed structure of 2016-17 was shown in Annexure 2.
- 12. All the recommendations of the DAC (Department Academic Council) minutes held on 10<sup>th</sup> September 2014 were approved.

BOS-CHAIRMAN

Professor & Head

Professor & Head

REE

Dept of EEE

K L University

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# **Board of Studies (BOS)**

The following members attended the meeting on 4<sup>th</sup> May 2015 at 10:30 AM:

S.No	Name of the member	Designation	Member	Signature
1	Dr. O. Chandra Sekhar	Professor, BOS Chairman	BOS Chairman	Char
2	Dr.D.V.S.Siva Sharma	Professor, NIT Warngal	External	DV1858VW
3	Dr.C.Nagamani	Professor, NIT Tirichy	External	Mafaray
4	Dr. P. Linga Reddy	Professor	Internal	<u> </u>
5	Dr. G. Kesava Rao	Professor	Internal	Ch
6	Dr.M.K.S.Sastry	Visiting Professor	Internal	nylls
7	Dr. K. Subba Rao	Professor	Internal	Amer
8	Dr. S.V.N.L.Lalitha	Professor	Internal	10
9	Dr.Y.P.Obulesu	Professor	Internal	2000
10	Dr.S.Lakshminarayana	Professor, ECE Dept. KLU	External	S. (Dain nos
11	Dr.K.Harinath Reddy	Professor	Internal	Han Rolls
12	Dr. K.S.Srikanth	Professor	Internal	RS
13	Dr. A. Pandian	Associate Professor	Internal	Aladia
14	Dr. P.S. Varma	Associate Professor	Internal	Pol Vagence
15	Dr. M. Kiran Kumar	Associate Professor	Internal	Affers
16	Dr.D.Sudha Rani	Assistant Professor	Internal	my.
17	Mr. K. Narasimha Raju	Associate Professor	Internal	Knith
18	Mr. D. Narasimha Rao	Associate Professor	Internal	
19	Мг.А.Арра Rao	Associate Professor	Internal	Allega
20	Mr. D. Seshi Reddy	Associate Professor	Internal	Melety
21	Mr. J. Somlal	Associate Professor	Internat	6 Synlar
22	Mr. R.B.R. Prakash	Associate Professor	Internal	
23	Mrs. K Sarada	Associate Professor	Internal	forder

# KL University Department of Electrical and Electronics Engineering 2015-19 Batch Course Outcomes From I - I SEM to II-II SEM Course Articulation Matrix

ECOLOGY AND ENVIRONMENT	1 100		Course retained from earlier curculam	This course is retained to gave awareness on enviorment & sustainability	2-0-0	2-0-0 2-0-0 2-0-0
	003	Understand the knowledge on solid waste management, disaster management and EIA process				
	100	realize and understand the basic aspiration, harmony in the human	1	This course is retained to gave		
ļ	T	te the roadmap to fulfil the basic aspiration of human beings.	Course retained Irom earlier curculam	awareness on life skills enviorament & sustainability	2-0-0	м
1		analyze the profession and his role in this existence.				
1		Remember speech sounds and apply stress and intonation rules to		This Currey is modified to		
1		s and apply those by using the basic and	course modify from carlier circulum	ins Course is mounted to enrich the students with Communication skills for	2-0-0	61
ı	8 8	nd tone of the author.		Employment		
1		Understand the importance of interpersonal skills				
l	100	Understand the method of identifying the meaning of words and apply them in contexts.				
ı	- COS	analyze different cultures and the importance of cultural communication.		This Course is added to enrich the students with inter personal	6	,
í	Π	improve	A New course introduced	Communication skills for Employment	1	4
	9	reading speed.				
	Š	Understand and apply writing strategies in office! formal communication				
l	7 100	Apply the various strategies of presentation Skills.				
l	8	Analyze the given topics and situations and applying the strategies of erroundiscussion.		This Course is added to enrich		
I		concepts of critical and analytical reading skills.	A New course introduced	Communication skills for Employment	79	61
I	3	Apply the strategies of sentence formation and sentence completion.				
1		Analyze one's own strength as a speaker/communicator and use				
- 1	io.	ion while istening				
		000	A New crustee inferniscen	This Course is added to enrich	j	64
1		the organisation of the passage and also analyze the tone.		skills for Emphyment		
	603	attitude and style of the author				
i		Acquire knowledge of and apply people skills in various social				
- 1	3	Understand the method of identifying synonyms and antonyms and				-
	100	analyze the meaning of a word from the context				
	603	Analyze issues and arguments in the process of critical reasoning and		This Course is added to acquire		
1		heir importance while solving	A New course introduced	quantitative aptitude skilis intended for Employment	7	М
		Apply the short cut methods on the concepts of different models in calenders, ciocks, blood relations and various types of arrangements		- "		

Course Code	Course Title	CONO	Description of the Course Outcome	Course Type	Rationle	L-T-P	Credits
			Understand and analyze the depth of a topic and use the advanced levels in creative speaking and debating.		-	•	
		5	Understand and analyze various strategies involved in writing an essay				
15 EN 3206	CORPORATE		answer questions	A New course introduced	This Course is added to acquire corporate communication skills	7-0-1	rt
	SKILLS	600	t on the given mormation ious employability skills & anlyze a situation		intended for Employment		
		ğ	outry f basic geometry and their importance while				
		so:	solving the problems  Model physical laws and relations mathematically as a first order				
			differential equations, solve by an appropriate method and interpret				
		100	the solution.			•	
			Model physical laws and relations mathematically as a second/higher		This Course is retained to		
	SINGLE VARIABLE		tions, solve by an appropriate method and	Charco retained from carlier	Enhance the mathematical		
15MT1001	CALCULUS AND	703		curculam	knowledge on matrix algebra	2-2-2	4
	MATRIX ALGEBRA	60	series to solve differential equations.		system networks		
			Model physical problems mathematically as a system of linear				
	•		ods. Also,				
		충	n values 2			_	
		SOS	Verify the solution of problems through MAILAB.				
		Š	Understand the concept of forces and apply the static equilibrium				
		5					
		ë	Analyze co-planar and non co-planar system of forces. Apply the concept of centroid & centre of gravity to determine moment				
		co3	2 2	Course retained from carffer	To enrich the basic knowledge	,,,	4
(SME1001	MECHANICS			curculam	design of electrical machines	; ;	•
		Ç	without considering forces.				
			Understand the engineering systems to prepare and demonstrate the				
		500	models with the neip of mechanics concept to solve the engineer mg				
			Understands structure of crystalline solids, kinds of crystal				
		00	imperfections and appreciates structure-property relationship in crystals.				
			Understands the role of electronic energy band structures of solids in				
		C05	governing various electrical and optical properties of materials.  Todaestands role of molecular vibrations in determining thermal			•••	
			1		To enhance the knowledge of		
15PH1001	ENGINEERING			course modify from earlier circulan	materials for designing	7-7-5	**
	MATERIALS	c03	engineering applications.		electrical equipment		
· Market			Understands spin and orbital motion of electrons in determining				
			magnetic properties of materials and identifies their role in				
		8	engineering applications.				
			Apply the knowledge on structure and properties of materials while				
	_		related experiments and develop some inter disciplinary				
		500	projects.				

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L-T-P Credits			7						n					7						5							8		-						7				
1_			2-2-2				-		2-0-0		_			2-2-2						S. Jack							9-0-0 9-0-0-0			+			<u>.</u>		1				
Rationle		To entrance the knowledge of	chemical process in designing	electrical components					basic knowledge on biological	aspects to acquire life skills			This Course is added to	Enhance the Analysis of	Electronic systems				This course is modified for	enhancing problem solvig skills	through Clanguage & Data	Structures				This cause is retained for	enriching the software skills in	ugreeb -						To enhance the knowledge of	meaasuring quantities with	engineering equipments			
Course Type			Course retained from earlier	Calcinati					A New course introduced					A New course introduced						A Mass season introduced	A New course introduced						Course retained from earlier cureulam								Course retained from earlier current				
abcdeffghijk	Examine water quality and select appropriate purification technique [2]	Predict potential complications from combining various chemicals or 2 2	Treeting are the property of a party of the	Discuss Hindamental aspects of event ochemistry and materials secured 2	Apply phase rule, polymers, conducting polymers and nano chemistry	to engineering processes	An ability to analyze & generate experimental skills	human body		Understand the importance of Diet and Nutrition	Biosensors	Understand the circuit elements, kirchoff's law and theorems to solve	the networks	Apply the procedure to determine form factor and peak factor to	Apply vector algebra to fields fundamental to analyze electric and	magnetic field distributions	Apoly Maxwell's equations for static and time varying fileds	Hustrate how problems are solved using computers and programming.   2	Interpret & Illustrate user defined C functions and different		Implement Linear Data Structures and compare them.	Implement Binary Trees.	Apply the knowledge obtained by the course to solve real world	problems.	Draft Orthographic views, projections of planes and , solidsmanually and by using CAD software Tool (AutoCAD)	Land and the state of the state	Drafting Sectional views, Isometric views, development of surfaces	ned perspectives ynews manually and by using Autoc. X.	Project based workshop to prepare different models with the aid of	workshop trades i.e., Carpentry. Tin smithy. House wiring and Fitting	Understand and apply the fundamentals of a measurement system,	Characteristics, transducers and med overy name since and	ectrical & computer parameters, and apply	different measuring techniques on various electrical parameters using	simulation and experimentation tools.	Understand electronic & electro-physiological parameters, and apply	measuring techniques on electronic parameters using simulation and	different measuring techniques on civil and	machanical passameters neing simulation and experimentation tools. [2] 2
CONO				603		3	ço;		100	C02	503		ō	5		CO3	CO	100		C02	CO3	ğ		505	100		į	202		CO3		ē	3		C02		ć	3	ĝ
Course Title		1	ENGINEERING	CHEMISTRY	i				BIOLOGY FOR	ENGINEERS	•			FIELDS &	NETWORKS		<u>j                                    </u>		J	C PROGRAMMING	AND DATA	STRUCTURES				.1	ENGINEERING	GRAPHICS							MEASURMENTS				
Course Code	1		15071001	1001001						15BT1001	,			1901 33 24	12 22 1401						15CS1001	•					15ME1002								15GN1003			-	

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r-P Credits	2-6-2	2-2-2	2-2-2	2-2-2	222
Rationle L-T-P	This course is introduced to carriet the basics of all consecring concepts required for employability	This Course is retained to Enhance the coding skills with JAVA for Empoyability	This course is added to impart the designing uppers of digital systems for employability	This course is added to aquire the knowledge on computer 3 architecture and organisation	This Course is reatined to acquire basic knowledge on electrical networks
Course Type	A New course introduced	Course retained from curlier curculam	Course retained from earlier curculam	2 A New course introduced 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Course retained from earlier curculam
Description of the Course Outcome	Understand the basic principles of engineering design Understand and analyze the possible carcer options in Engineering and develop strategic plan, career targets and mechanism to achieve the stane. Understand the aspects of critical thinking and problem solving in engineering Apply to knowledge of critical thinking to frame real-world problems and provide basic solution approach to such problems from 2	Understand basic coacepts of OOP, introduction to classes and objects  through java language and apply Understand the concepts of constructors, overloading, parameter passing, access control, inheritance and apply Understand puckages, interfaces and exception handling and apply Understand I/O streams & apply and understand basic concepts of multi threading	erical and charncter representations in digital logic,  ata codes and the corresponding design of  atity  gic gates, logic theorems, boolean algebra and  a sequential systems design using standard gates and  inimization methods  sign for logic gates, combinational and sequential logic  z rammable logic devices	the CPU functional units- d logic unit, the instruction 2 care any virtual memory 2 types of I/O transfer 2 d GISC CPU's and the design 2 d drive circuits using LOGISIM 1	Understand the concept of mutual inductance, series and parallici caronance, network topology to solve complex networks and 3-phase ircanists' voltage and current relation Analyze the magnetic circuits, transient response for AC and DC excitation and myon port network parameters Evaluate one port networks using Foster and caur forms 5 Design the prototype low and high pass filters. 5 Test and Evaluate the concepts learnt using any simulation tool or
CONO		CO3 CO3	000 000 000 000 000	CO2 CO3 CO4 CO4	CO C
Course Title	INTRODUCTION TO ENGINEERING	ORJECT ORIENTED PROGRAMMING	DIGITAL SYSTEM DESIGN	COMPUTER ORGANIZATION AND ARCHITECTURE	ELECTRICAL CIRCUITS.
Course Code	15GN1004	15 CS 2002	18EC1101	1SEM2001	15 BE2103

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L-T-P Credits	4	77	4	7	7
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Rationle	This Course is added to acquire basic knowledge of smalysis of electronic components, and its design	This Course is added to acquire basic knowledge on DC Machines & Trussformors	This Course is retained to acquire the coding skills required for employability	This Course is retained to acquire the colorge skills required for employability	This Course is added to acquire the basics, browledge of signals, and its processing required
Course Type	A New course introduced	course modify from cardice circulam	course modify from earlier circulam	course retained from earlier circulam	A New course introduced
h i j i k	M M M	n 0	ю м м м м — — — — — — — — — — — — — — — —	н и	2
defigh		ci ci ci ci	N N N N N	n	n n ti n n
labcide	8 8 9 9 8	N 51	0 2	7 L C	, e
Section of the Course Outcome	Understand the industrial processes and organizations connected with the profession and relate classroom learning with real life situation by taking into the consideration of various design concepts. Understand the concepts of various diodes and their applications. BJT concepts as operation, biasing and frequency response. FFT concepts as operation, biasing and frequency response. Feedback concepts and their analysis. Concepts of various oscillators and anolications	Apply the basic principles of electromechanical energy conversion to electrical machines  Analyze operating characteristics of various types of DC generators  Identify various speed control methods of DC motor and evaluate this performance  Evaluate the performance of a transformers and selecting it for particular application.  Test the DC machines and transformers to evaluate their performance	Abbe to understand and analyze the architetural features of CISC type of general purpose processor Intel 8086 microprocessor.  Abbe to understand and analyze the architetcural features of CISC type of nicrocontroller and analyze the architetcural features of CISC type of nicrocontroller. Intel 8051 microcontroller.  Abbe to understand and analyze the architectcural features of RISC type of nicrocontroller-PIC microcontroller.  Abbe to program 8086 microprocessor, 8051 and PIC microcontrollers in assembly language using TASM,KEIL,MPLAB and protems tools.  Abbe to develop a real time application using 8051, & PIC microcontrollers through project based labs.	Select from all commercially available 3-4 IM for given application  To understand the construction, operation and armature reaction of a  3-4 synchronous generator and identify the Understand and analyze the performance of synchronous motor by varying excitation and varying load.  Test the induction machine and synchronous machine to evaluate their performance  Project based workshop to prepare different models with the aid of workshop trades i.e., Carpentry, In smithy, House wiring and Fitting	Understand various signals and model physical process using them. Acquaint with various transformation methods and their potential for applicability in various signal analysis conditions. Demonstrate sampling and its potential applications in communications, discrete signal acquisistion etc., Evaluate discrete system behaviour and its reponse to facilitate system design.  Evaluate discrete time system to meet noise elimination like applications. Analyze non stationary signals and analyze them in both time
CO NO	500 500 500 500 500	CO C	5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	CO C	500 500 500
Course Title	ANALOG ELECTRONIC CIRCUIT DESIGN	DC MACHINES & TRANSFORMERS	PROCESSORS AND CONTROLLERS	AC MACHINES	SIGNAL PROCESSING
Course Code	15EC2103	15 EE 2104	15EM2202	15 EE 2205	15£C2206

Credits		44		=		····					4									₹						-,						4			
L-I-P		2-2-2									2,2,2									2-2-2						2-2-2						2-2-2			
Rate		This course is retained to impart knowledge on Geneating	and distributing power							This Course is retained to	contance the basic skells required to analyse complex	systems							This Course is retained to	required to analyse the power	transferred				This Course is retained to	cahance the basic skills	electroniccircuits				This Courses to wetching to	acquire the skills required to	Protest the Power system networks		
Course Type		m carlier	circulam						•		Course retained from earlier curculam								:	Course retained from carlier curculan						Course retained from earlier	the current		- Control of the Cont			Course retained from carlier	curculan		
abcdeffghilik	4	C	•		ei					e1			2		2		esi		13			2 2	4		19	2	ė		2		2       2			cı	2 2 2
Second Description of the Course Outcome	Understand various generating stations. Understand the concepts of transmission line parameters, Corona.	Mechanicai Sag and Insulators Analyze the performance of overhead transmission lines and	underground cables.	Analyze substation layouls and their design consucerations	distribution using any software tool or hardware	Students can be able to understand control system concepts such as	open, closed loop systems, transfer function approach, mathematical	modeling of physical systems and can understand analyze the	Students can be able to Analyze the time domain and	frequency response of physical systems	Students can be able to understand and analyze stability of given	transfer functions in time and Frequency domain and can be able to	analyze the process of Converting state space equations into transier function for the given model.	- Andrew Colombia (Colombia)	Students can be able to design and analyze controllers	Test and apply the knowledge obtained in the subject by Matlab or	hardware. To analyze the short circuit faults in a power system	TO STREET THE PARTY OF THE PART	To apply numerical methods for the solution of load flow problem	To Select the best generators to have Economic Dispatch & to Evaluate	the performance of Load Frequency Control	To Understand and analyze rotor angle stability	Test and Analyze various short circuit faults, load flows, economic dismarch problems, rotor angle stability problems using MATLAB	Select appropriate switch for a given power converter	Evaluate the steady state performance of Basic DC-DC converters	Evaluate the performance of Basic Switch-Mode PWM Inverter	Understand and analyze the operation of Basic Phase controlled	Tout and analysta havin names electronic converters by using Matlab	self and grandle basic power electronic convertices of managements software or hardware.	To and one mit evetem and to draw the reactance diagrams	To analyze the short circuit faults in a power system	To Evaluate the performance of different protective relays & Circuit	To understand the concepts of lightning arresters and the neutral	grounding	Test and Analyze various power system protection concepts using MATLAB
CO NO	100	200	003	độ	COS			ξ		C02			003		ż		ő		CO2		CO3	ठ	ý	COI	CDZ	503		8	SOO	5	Ç05		803	700	500
Course Title		GENERATION.	TRANSMISSION &	No.				•			CONTROL SYSTEMS									POWER SYSTEM	ANALYSIS					POWER	ELECTRONICS					POWER SYSTEM	PROTECTION		
Course Code			15 EE 2206								15 PF 2207									15 EE 3108							15 55 5109						15 EE 3210		

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Kationie	This Course is retained to enhance the basic skills required to analyse the control of electrical machaines	This Course is retained to nurich the knowledge on planning & automation of power systems	This Course is retained to cariet the knowledge on restruetured power systems	This Course is retained to establish the required knowletige on Power Transfer and improving quality of power	This Course is retained to enrich the knowledge on enhancing quality of power	institutores antenued to acquire knowledge no Smart grid technologies for power vertor annications. Studem Can get employability in power electronics sector	by completion of this course emplyability drives	student get employability in poew r system transmission und distribution sector	
Course Type	course modify from earlier Greulam	course modiffy from carlier circulam	course modify from cartier circulam	course modify from earlier circulam	course modify from carlier circulam	course modify from earlier circulam course modify from earlier circulam	course modify from entiler circulom	A New course introduced	
Description of the Course Outcome a b c d e fightilik	Understand the concept of fundamental torque equations, Modes of operations, equivalent values of drive parameters, converters, DC indivors and AC Motors. Analyze the speed forque characteristics of DC Drives, Induction Analyze the speed forque characteristics of DC Drives, Induction Analyze and Synchrouous motor Drive Analyze various control techniques of DC drives and AC drives Analyze various control techniques of DC drives and AC drives and observe the output waveforms.  Design an AC drive and simulate those circuits with design parameters  2 Design an AC drive and simulate those circuits with design parameters  2 2 2 2 2 2	Understand the methods to find load forecasting and various tariffs  and meters Understand the optimal locations of substation capacitors and importance of protection and coordination of different protective devices.  Understanding the SCADA and required components and its function  1		Evaluating various HVDC transmission systems converter circuits and its control scheme.  Analyzing FACTS devices for improving system stability.  Analyzing the knowledge for improving stability and understanding the concepts of harmonics and designing of filters.	es. 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	To understand the functioning of various devices in Smart Grids 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Understand the Mathematical Modeling of Syachronous and Asynchronous machines Analyze various advanced electric drive control techniques for special machinestechniques for Synchronous and Asynchronous machines Analyze various advanced electric drive control techniques for special analyze various advanced electric drive control techniques for special	Evaluating various HVDC transmission systems converter circuits and 12.2.  Analyzing FACTS devices for improving system stability 2.2.  Analyzing the knowledge for improving stability and understanding the concepts of larermonics and designing of filters.	
CO NO	CO1 CO3 CO3	C00 C03	CO CO CO CO	CO1 CO2 CO3	\$00 \$00 \$00 \$00	CO1	00 00 00	CO1 CO3	
Course Title	ELECTRIC DRIVES	DISTRIBUTION SYSTEM PLANNING AND AUTOMATION	RESTRUCTURED POWER SYSTEMS	HVDC & FACTS	POWER QUALITY	SMART GRID TECHNOLOGIES ADVANCED POWER ELECTRONICS	ADVANCED ELECTRICAL DRIVES	HVDC & FACTS	
Course Code	15 EE 3211	15 EE 3251	15 EE 4155	15 EE 4156	15 EE 4157	15 RE 4158	15 EE 4159	15 EE 4160	

Credits	(a	0	n	13	м	en .		17	()
L-T-P	3-0-0	3-0-0	3-5-6	9-9-5	3-0-0 -0-0	0 <del>-0-2</del>	35	3.0-0	3.0-0
Rationle	This Course is retained to enrich the knowledge on enhancing quality of power	This course is added to acquire knowledge on New technologies of electric vechicles required for vetticle industry.	s retained to establish the required skill on estimation & identification of systems for employability in Automation	This Course is retained to establish the required skill on Digital systems for employability in Automation	This Course is retained to establish to required skill on Nov-Linear systems for employability in Courtel & Automation sector	This Course is retained to establish the required skill on Optimal courted strategies for employability in Control & Automation sector	This Course is retained to estublish the required skill on Adaptive control stratagies for employability in Control & Automation sector	This Course is retained to establish the knowledge on Energy Auditing for employability in Energy & Automation sector	This course is added to acquire the knowledge on utilisation of electric power required for employability
Course Type	course modify from carlier circulam	A New course introduced	course modify from carlier circulan	course modify from earlier circulam	course modify from carder circulan	course modilly from carlear circulsm	course modify from earlier circulam	course modify from earlier	A New course introduced
Description of the Course Outcome	Understand various power quality issues.  Analyze various power quality issues and its causes.  Analyze the different mitigating techniques for voltage sag and swells.  Design and analyze voltage sag and swell using simulation tools.	Understand the vehicle mechanics and working of Internal combustion  1  Analyze the battery and Electric Drive performance for HEV  Understand the control strategies for HEV  1	Understanding the importance of probability in state estimation  Understanding and analyzing the adaptive control techniques  Evaluating the stability performance of adaptive controllers	Understanding the importance of Z-Transform in Discrete time systems Evaluating the stubility performance and compensating techniques for Digital control systems Designing of State feedback controllers and observers	Understanding and analyzing the nonlinearities in the control system 1  Evaluating the stability performance of Nonlinear systems 3  Understanding and evaluating the performance of Fuzzy controllers for nonlinear control systems 3	Formulate first order optimality condition for calculus of variation and spring front optimal control problem  Develop the optimal LTIV system by solving Riccari equations 2  Jinderstand and estimate the operation of optimal control techniques 2	и	Understand the need for energy conservation and various tariffs 1 1  Understand the auditing methods and their peractice by case studies. 1 1  Apply the energy conservation techniques to motors, transformers. 2 2	Understand the motor ratings for different applications Analyze the Characteristics and control strategies of locomotives for track electrification.
CONO	100 00 00	CO2 CO3	00 00 00	ē 20 8	CO2 CO3	CO1 CO1		100 COS	100 CO CO
Course Title	POWER QUALITY	HYBRID ELECTRIC VEHICLES	STATE ESTIMATION & ADAPTIVE CONTROL	DIGITAL CONTROL SYSTEMS	NON LINEAR CONTRÓL SYSTEMS	OPTIMAL CONTROL SYSTEMS	ADAPTIVE CONTROL SYSTEMS	ENERGY CONSERVATION & AUDIT	UTILIZATION OF ELECTRICAL ENERGY
Course Code	15 EB 4161	15 EE 4162	15 EE 3253	15 EE 4163	15 EE 4164	15 EE 4165	15 EE 4166	15 EE 3254	15 RE 4167

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Kationie	This Course is retained to	establish the knowledge on Solar energy for employability	in Solar manufacturing	This Course is retained to	establish the knowledge on wind energy for employability in	wind power plants	This Course is retained to establish the knowledge on	Nuclear energy for	cmpieyzaniny in mucicar power		This Course is retained to	Camputer architecture for	employability in IT sector			This Course is retained to	establish the required skill on	Embedded systems sector			This Course is retained to	establish the required skill on	emolovability in Embedded	systems sector			The section of the section of the	establish the required skill on	embedded for employability in	garacturer systems seems			This Course is retained to	establish the required skill on DSP for employability in	Embedded systems sector	
Course Type		A New course introduced			A New course introduced			A New course introduced				A New course introduced					A New course introduced						A Ivew course introduced						A New course introduced				;	course modify from carlier circulan		
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Description of the Course Outcome	Understand and analyze basic concepts of the solar photovoltaic	Analyze the different applications of solar thermal energy	Understand and analyze the fuel cell characteristics, working principle and comparison of different types of fuel cells	Understand and analyze basic concepts of the wind energy conversion system	Analyze the different types of wind mills, control systems and design	Apply the basic concepts of the bio energy conversion into different forms of energy	Inderstand the basic concepts of nuclear energy conversion system	Analyze the geothermal energy conversion systems	Analyze the fidal characteristics and different types of tidal power generation systems	Understand the evolutionary steps of computer, complex instructions and microneogramming	Understand, analyze and design main, cache and virtual memory	organizations.	Understand the design assues of comprex procure a cancern es also microprocessor evolution 4004 to 4	Understand synchronization and sequential consistency and	Understand Full-custom & Semi Custom design methodologies of for	designing different PLD architectures.	Study and design of combinational and sequential circuits using PLEs.	Study and analysis of different CPLD and FPGA architectures	Study of New generation Architectures of Programmable Logic	Devices	To understand the VLM tabrication process and to be able to interact with integrated circuit process engineers	To analysis the theory and CV characteristics of MOS transistor	To analysis MOS gate static and switching characteristics	To design and layout MOS logic circuits	Analyzing CMOS fault models and test principles	Able to analyze embedded systems, its design cycle, modeling, layers of		Devices and Networks	Able to understand, evaluate and select appropriate software	Understand various embedded system design methodologies and be	abie to develop and demonstrate a small embedded system for a real	time application.	Understand and analyze the basic concepts of Digital Signal Processing by MATI AB and number systems	Understand and analyze various architectures for programmable DSP		Programming of 1 MSS 20th 28353/t 2812 Digital Signal Frocessor
CONO	ē	8	COS	100	000	603	Ö	C02	60	ő		C07	COS	ਲੁ		ë	Ş	8	;	ğ	ē,	C02	ő	5 5	900	- 8		COZ		3		흥			COZ	3
Course Title	dir.	CELL ENERGY	SYSTEMS		WIND AND BIOMASS ENERGY SYSTEMS		NUCLEAR,	CEOTHERMAL AND	SYSTEMS			COMPUTER	ANCHAIRCIONE				DI De AND EDCAS						VLSI DESIGN					SMEDDED CVCPEM	DESIGN				-	DSP PROCESSORS		
Course Code		15 EE 4168			15 EE 4169			15 EE 4170				15 EE 3255					25 CT 4171	10114779 61					15 EE 4172						15 EE4173					15 EE 4174	:	

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Course Type Rationle L-T-P   Credits			Course retained from earlier with this course student acquire	employability in industry		delination despitate commerce sight define	senologability indulastry			5
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Description of the Course Outcome	Description of the commercial state of the commercial				- Constitution - Cons					
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- True.	Course Code Course Line Course Line	Term Paper	Minor Project	Major Project OR Industrial Practice	School		Industrial Training	(Summer Break in II/IV	year)	
	Course Code	15 1E 3250	15 IE 4049	15 IE 4050		15 IE 4048			-	

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KL University

# Department of Electrical and Electronics Engineering 2015-17 Batch Course Outcomes From I - I SEM to II-II SEM

Course Articulation Matrix M.Tech in POWER ELECTRONICS SPECALIZATION

Credits		_	4			4				4				च				4			•	4		
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Rationle		This Course is modified to entich	the students knwtedge in analysing convertors for power	בוכבתסווס וומתואה		This Course is added to enrich the students knwledge in designing aspects of machines	for electronic mactune industry			This Course is moduca to citizen the skills required to operate and	converiers for Employment		This Course is modifed to enrich	the skills required to control electrical equipment, with	modern techniques for Employability		This Course is modifed to earith	the Mallab skills required to model the power electronic	converters for Employability				analyse power electronic	
CourseType		Course modified	from carlica curculani			A New course introduced				Course modified	curculam			Course modified from earlier	curculam			Course moduled from carlier	curculan			Course modified	curculam	
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Description of the Course Outcome	Select and design power electronic convener topologies for a broad	Tange in grant conversion and analyse and simulate the performance of power electronic conversion	Ability to model and design controllers for the closed loop operation Ability to model and design controllers for the closed loop operation of particulars	Apply the basic concepts of power deterrories to design the circuits in the flede of AC and DC drives, power generation and transmission and onergy conversion, industrial applications, extraction of energy.	from renewante sources.  Design and simulate the modeling concepts of 3-phase synchronous machine, Kron's primitive machine.	Analyze the mathematical model of separately exeited D.C Motor.  Analyze the mathematical model of separately exeited D.C Motor.  D.C Series & shunt motor and its steady state, transient state analysis.	Transform from 3 phase to 2 phase parks transformation of induction	Design the modeling of 1-phase and poly phase induction machine, roses (field theore, modeling of synthytotals machine)	To study I - a & 3-4 controlled bridge rectifier with motor load on continuous and discontinuous modes of operation and effect of continuous in the formation of the state of	To understand the operation of three phase naturally commutated	To study the steady state analysis three phase converer controlled and chapper convolled DC Motor drives and dasign speed current	To know the closed loop operation and dynamic simulation of DC	moder grave system with comment continued in the course introduced and management of discrete data	in case of multiple input and multiple output systems, this course	figures to the state of practical through the control of practical through the course distributed will control of practical sections, this course deals shout Non Lingaria's	since stability is most important for everyu systems to give it satisfactory toeformance, this topic also helps	Understand the back ground processes related to the numerical solution used in seneric simulators.	Choose the numerical solver to be used for a given type of analysis	Understand the reason for convergence problems occurring during	Simulate the behavior of Power Converters, DC and AC drives	Understand the concepts, advantages and disadvantages of the techniques in evolutionary computation	Design suriable neural networks, fuzzy systems, genetic representations	with appropriate finess functions for simple problems [Know the key issues in using these techniques in Matlab for search of	difficult scarch-stoces Awareness of the different approaches and different applications in the field
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Course Title C		10,70,1924	POWER	RS RS		POWER ELECTRONI	OF DRIVES	<u> </u>		OPTIMIZATI	TECHNIQUE	1		Modern		-			CONVERTE			MICRO		SYSTEMS
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Rationle		This Course is modifed to enrich the students knowledge in analysing advanced power convertors for power electronic	inclustry		المراسم مرا المرازية مرمد مرازية	the students knwledge in	drives for power electronic	mdustry	This course is intended to	acquire knowledge on Smart grid	applications		This Course is added to establish the required skill on FPGAS for the batter in Tenhalded externs	comprovements are controlled by second			This course is added to acquire	electric vechicles required for	ATHERE BUREAU		This Course is modified to		Transfer and improving quality of	bawat		ž.	techniques necessary for an industry		This Course is modified to	. <u> </u>	on Special machines uniscu in industry		This Course is modified to	8	hybridized models utilised in transportation sector	
Course Type		Course modified from cartier curculan				A New course	introduced		Courses avoidified	from earlier	curculam		A New sourse	tunogance			A None course	introduced			(	from earlier	curculam			Course modified from carlier	curoulam			Course modified	curculam		·	Course modified from carlier	curculam	
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Description of the Course Outcome	Three Phase AC Voluege regulators-Analysis of 3-phase regulators with star and delta connected R and RL loads - Load voltage	participant Services and fully controlled and fully controlled and fully controlled Converces with RL load and load vollage and current harmonic manipus, there phase dual converters-PWM control of 3-phase manipus for converters-PWM control of 3-phase.	Analysis Single-phase single stage boost power factor corrected rectifier, three phase boost PFC convertor, sinusoidal PWM ~	modified PWM Analysis of output voltage for continuous (CC) and discontinuous	conduction mode (DCM).  Understand the vector control principle of AC motor drives	Evaluate speed control performance of 5-Phase induction motor drive	Analyze the dynamic behaviour of SRM motor drives under various	Investigate the performance of BLDC Motor drive using various	Control techniques Understand basic concepts of smart and in power network.	Analyzing swing equation and equal area eriterion	Understand synchronous machine modeling	Understand exertation Systems and power System Seatures: Introduce digital design techniques using various Programmable logic	To introduce FPCA architecture, digital design flow using FPCAs.	and other (ceimologies associated with their programmers gave and	To learn about various applications of FPGAS	To get to know about the logic and physical designing of an Aste.	Understand the volide mechanics and working of Internal	Analyze the buttery and Electric Drive performance for HEV	Understand the control strategies for HEV	Working and mature model of the Y	transmission	To identify the electrical requirements for it and the components used in AC to DC conversion.	To understand the operation of HVDC conversion technology	To understand the fundamental requirements of HVDC transmission line design and To identify factors affecting AC-DC transmission	Discussion of load cells, torque meter and various velocity pick-ups	Exposure to various accelerement pick-ups, vibrometers, density and	To lave a sound knowledge about thermocouples and pyrometry	To have an adequate knowledge about pressure transducers	To understand the operation of different special machines	To select ornerent special machines as part of control systemicomponents	To use special machines as transducers for converting namerals into electrical signals	To design digital controllers for different machines	Understanding the kinematics and dynamics of Vehicles and different battery parameters, characteristics.	Understand the operation and control of AC & DC drives	Understand various types of internal combustion engin	Understand various control strategies in Hybrid Electric vehicles
CO NO	ē	200	cos	Ę	<u> </u>	C02	ä	Ş	100	C02	503	8 8	CO2		g	Ö	100	8	8	3	8	00	S	ġ	8	8	8	§	8	g	CO3	§	8	CO2	89	Š
Course Title		MODELLIN G AND SIMULATIO N OF	POWER ELECTRONI			INDUSTRIA	APPLICATIO NS OF	ELECTRONI			Sman Grass		FPGA		Applications			Electric				EHVAC and					n & Control			Special	Machines			Electric and		
Code	e de la companya de l	1558305					15EE506				[SEE317			155E508				15EE535					1552550			15	51AJ			25	S 18			1.5	51A3	

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Credits			•			m				m				'n		•				'n		-			М				n			m					m.	
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Rationie		This Course is modified to	for automation industry in using		This Course is modified to	for utilising senors &	transducers in automation industry		This Course is modified to	establish the required skill set for automation industry in using	DSP processors		This Course is modified to	enhance the required skill set for utilising and integrating non	conventional energy sources in			,	This Course is modified to	enhance the required skill set for	uthrsing At techniques in power cleetronic industry				critance the knowledge on	FAC 15 gevices in impoving power quality		This Course is modified to	enhance the knowledge on enhancement of power quality	techniques in industry	-	embance the skill set on	cleatric machines			This Course is modified to enhance the estimation	techniques and adaptive controlling stratagies in power electron industry	
Course Type		Course modified	from carlier curculan		Course modified	from carlica	curculam		Too Silve on Comment	from carlior	curculam			Course modified	curculam				bulling modified	from carlier	curculam				Course modified from carlier	curculam		Course modified	from carlier	curcelam	Political second	from earlier	curcuianı			Course modified	from carlier curculam	
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Description of the Course Outcome	Ability to apply knowledge of mathematics, engineering to understand	Ability to analyze a problem and formulate appropriate computing	Sciences for interoconsonal participation of a part	gopphiner based process ut men usaring mode. Ability to work, document and present as an individual and as a tenn- mentper to design formulate and implement experiments using modern tonde.	It deals with various types of Sensors & Transducers and their working principle	1) deals with Resistive. Capacitive and Inductive transducers	It deals with some of the miscellancous transducers also	Amplication of sensors and transducers in industrial sector	Understand types of digital signals and Transforms	application of digital signals to signals andsystems	Design IIR & FIR filters	Estimate power spectrum using Various methods	Christic Awardiess annoth singents soom reminerations someone someone and christic awardies and christical companies.	Emple students to understand various renewable energy technologies and systems.	To impart the knowledge of Storage technologies form the	Equip the students with knowledge and understanding of various	possible mechanisms chour renewable mentry motodis	Comprehend the concepts of feed forward neural	networks Analyze the various feedback networks	Understand the concept of fuzziness involved in	various systems and fuzzy set theory.	Comprehend the fuzzy logic control and adaptive fuzzy	logic and to design the fazzy condorming general	Learners will be able to refresh on basics of power transmission tietworks and	Learners will be able to explain about static var compensator in detail and service south sections.	Learners will understand the significance about different voltage source	convertor taxes, trues controllers.  Learners will be able to analyze on FACTS controller interaction and control	coordination Understand various power quality issues.	Analyze various power quality issues and its entices.	Analyze the different militaring learniques for voluge sig and when.  There are not been waltere are and swell using simulation tools.	Comprehend state of the art technology of de and ac advanced	drives Solve problems: analyze performanceof de and ac drives.	1	_	Understanding the importance of probability theory in estimating system parameters	Understanding the importance of stochastic process in	Analysis of the optimal prediction and smoothing for discrete linear systems	Design the advanced drive and compare the performance with the existing one.
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Course Course Title CO		_l	Microcontrollo rs and	applications		Sensors and	Transducers	1		Digital Signal	applications			Non	Energy	Kesources			ŀ	Al Techniques in Power	Electronics &	Daves	_			FACTS			Silen O militin					Drives		State	Esti	
Course	Cog		IS EE			15 EE	51A6			15 25				1	51B2					7	51B3				20 20	52C1			13 語	525		15 EE	5203				15 EE 52D2	

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ourse	Course Course Title CO !	CONO	Description of the Course Outcome	a	د م	٠,	ų	_	e r Course Type	Rationle LT-P	L.T.P	Credits
ode			Design the advanced drive and compare the performance with the			~		~	Course modified	This Course is modified to		
15 EE	Advance	202	Ability to dynamic analysis of power Converters	Н	- 	$\mid \mid$			from carlier	PWM techniques to improve the	2475	en.
	Techniques	ő	Competency in operation of resonant converter					7	curculan	power transfer capability		
		1	Knew-how of multilevel converter	-	+	4	4					
			account for a range of power electronics applications for					~				
		8	developing power conditioning devices for integration of		_					This Course is modified to		
	Power		renewable and distributed electrical energy systems	-	-	-	+	-	Course modified	Course modified centrance the required skill set for:		
3 33 5	electronics for		describe and analyze basic topologies of both DC-DC			~		7	from earlier	utilising and integrating	3-0-0	м
\$2D4	renewable	3	converters	$\dashv$	+	+	+	4	curculam	reneweable energy sources in		
	chores		understand disturbances from power conditioning devices on	٠-,	-			7		power eleginonies industrysector		
	-	3	the power grid (i.e. power quality),	-	-	-	-	-	r	•••		
			understand and analyze electric and hybrid vehicle drive train		->							
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# KL University Department of Electrical and Electronics Engineering 2015-17 Batch Course Outcomes From I - I SEM to II-II SEM

# Course Articulation Matrix M.Tech in POWER SYSTEMS SPECALIZATION

Course Code	Course Title	CO NO	Description of the Course Ottcome	a	b	c	e	ſ	Course Type	Rationle	1T-P	Credit
-		coi	Understand power system stability and power ongle equations	Ý	ý	v			Course modified	This Course is modifed to emich the		
15EE512	Advanced Power	CO2	Analyzing swing equation and equal area criterion	₹	ď	Ť	T		from corlier	students kinvledge in analysing advanced analysis techniques for	3-0-2	4
1307.212	System Analysis	CO3	Understand synchronous machine modeling	¥	Ý	V	1		eurculam	power systems		
		CO1	Understand excitation systems and power system stabilizers	Ý	Ý	T	_	V		<b>F</b>		
		cor	Comprehend basic concepts and principles in power system analysis and Formulate and solve power flow problems, economic and environmental dispatch problems	ķ	ď	ď				This Course is modifed to enrich the		
	Power System	CO2	Demonstrate understanding in the theory of power system security analysis, voltage stability	U	V	Ť	T	1	Course modified	students knwledge in analysing power system dynamics & stability	3-0-2	4
15EE511	Dynamics & Stability	COZ	analysis, optimal power flow end state estimation. Develop algorithms as well as to use software tools to solve power system analysis and stability.	$\Box$	-		+	Н	from earlier curculam	aspects required for power system	3*****2	,
		603	problems	11	ľ	⅃_	1	L		scctor industry		
	1	€O4	To make sound recommendations and implement as required based on these solutions, analyse for practical power system problems	$ \cdot $	Ý	ı	1					
		coł	Describe various types of regulations in power systems and Identify the need of regulation and	U	T	†	T	T				
	N		deregulation	-	+	╁	t	H		This Course is intended to enrich the		
15191313	Deregulated Operation Of	CO2	Define and describe the Technical and Non-technical issues in Deregulated Power Industry	Ľ	4	1	L	Ň	A New course introduced	students knwledge in deregulation aspects of power system required	3-41-2	4
	Power Systems	CO3	Identify and give examples of existing electricity markets	14	Ÿ	1	╀	V		for power system sector industry		
		COA	Classify different market mechanisms and to summarize the role of various entities in the market	ΙÝ		٧		Ý				
		coı	lbis course introduces Z Transforms and mailysis of discrete data systems using Z Transforms	×				٧		This Course is modifed to enrich the		
	Mudern Control	CO2	in case of multiple input and multiple output systems, this course helps to deal with digital contro	Ы	V	7	Τ	ķ	Course modified	skifts required to control electrical	2 0 2	١.
1500314	Theory:		systems the Non - Linear systems which will come across in most of practical systems, this course deals	╂┪	1	+	t		from earlier curculam	equipment with modern techniques	3-0-2	. 1
		CO3	Inbout Non - Linearity's	Ш	۲	4	╀	Ļ	Curculan	for Employability		
		€04	since stability is most important for everyn systems to give it satisfactory performance, this topic	$ \cdot $	1	1		K				
			also helps			†	T	T				
		EOI	Understand basic concepts of smort grid in power network	11	4	4	Ļ	4	Course modified	This Course is modifed to enrich the		
15EE543	Power System Retinbility	CO2	Analyzing swing equation and equal area criterion	M	H	4	╬	╬	from carlier carculum	skills required to asses the reliability of power system for Employability	3-0-2	4
		€03 €04	Understand synchroneus machine modeling Understand excitation systems and power system stabilizers	+	7	1.	+	╁	CHCHIBRI	of poster system. In Employments		
					÷	+	+	$^{+}$				
		cor	Apply numerical or iterative techniques in power systems for optimal power flow solutions	$\parallel$		-	1	-	Course medified	This Course is modifed to enrich the		
151:18546	Optimization Techniques	CO2	Optimize the parameters in control systems for desired stendy state or transient response  Optimize the cost function in deciding economic factors of power systems	¥		1	╀	-	from earlier curculam	computational techniques with Mattab skills required to analyse power systems	3-0-2	4
		CO3	Design of electrical systems optimally using suitable techniques like univariate method, steepest	Ħ	Ì	,	- -	╁		pane game		
		CO4	descent method etc	4-4	`	1	4	$\perp$				
		coi	Learn various activities of operator	14	-		+	+		This Course is medifed to enrich the		
15181515	Real Time Centrol of Power System	CO2	Understand about Supervisory control and data acquisition	ľ		_ .	1	_	Course modified from earlier curculam	skills required for real time control of power systems for power system	3-0-2	1
	System	CO3	Real time software and state estimation Understand Security management	+	V	+	ľ	+	}	sector		
		сон			H	+	╁	†~				
		€O1	Differentiate between Algorithmic based methods and knowledge based methods	_[_		1	l	L	Course modified	This Course is modified to entich the computational techniques with		
15EE516	Af Techniques in Power Systems	CO2	Use the soft computing techniques for power system problems	Ň	3	1	. _	1	from earlier	Matab skills required to analyse	3-0-2	4
	Time Systems	CO3	Use appropriate Al framework for solving power system problems	14	Y	1	+	K	curculam	power systems		
		CO4	Apply GA to power system optimization problems	+	٧.	+	┿	+				
		cor	Understand basic concepts of smart grid in power network.	¥				1	l	This course is intended to acquire		İ
1588517	Smart Grids	CO2	Analyzing swing equation and equal area criterion	×	V	$\perp$	1	Ι	A New course introduced	knowledeg on Smart grid technologies for power sector	3-0-2	1
		CO3	Understand synchronous muchine modeling	1	٧	ᆚ	4.	4.	1	applications		
		CO1	Understand excitation systems and power system stabilizers	44	H	+	+	1,	<u> </u>		***************************************	-
		coı	Understand solient features of protective relaying electromagnetic relays and distance protective schemes	n v								
ESEE318	Power System	CO2	Apply the Over current protective schemes and differential protection of alternator and transformer	ı v		1			Course modified from carlier	This course is intended to acquire knowledge on Digital Protection of power systems for power sector	3-0-2	4
	Digital Protection	CO3	Analyse wire pilot and carrier current protection for transmission lines and neutral grounding		N	ĺ			currolam	applications		
		CO4	Understand the principle of operation of static relays and realization of various static relays and Understand current practices in microprocessor based numerical relays and the over voltage	V.		V		ç				
		<u></u>	protection  Learners will be able to refresh on basics of power transmission networks and need for FACTS	+	H	+	+	+	<del> </del>			<del></del>
	<del> </del>	l cor	controllers	Ľ	Ц	4	1	4		This are a la formulad to possible		
		COI			M	KĮ.	Ì		1	This course is intended to acquire		
<u> </u>		CO2	Learners will be able to explain about static var compensator in detail and series compensation	ļ	: I				A New course	I knowledge on FACTS Devices for	2 4 2	Ι.
15102547	FACTS Devices		Learners will be able to explain about static var compensator in detail and series compensation devices. Learners will understand the significance about different voltage source converter based facts controllers.		v	-			A New course introduced	knowledeg on FACTS Devices for improving power quality for power sector applications	3-0-2	4
15005147	FACIS Devices	CO2	devices  Learners will understand the significance about different voltage source converter based facts		-	1				improving power quality for power	3-0-2	.4
1599/547	FACIS Devices	CO3	devices Learners will understand the significance about different voltage source converter based facts controllers	v v	V				introduced	improving power quality for power	3-0-2	
	EHVAC and	CO3 CO3	devices  Learniers will understand the significance about different voltage source converter based facts controllers  Learniers will be able to analyze on FACTS controller interaction and control coordination  To understand the basic concepts of FHV AC and IVFX: transmission  To identify the electrical requirements for IVFC lines and identify the components used in AC t	V V	V				introduced  Course modified	improving power quality for power sector applications  This Coarse is retained to establish the required knowledge onEHVAC		.,
1902547 1502550		CO2 CO3	devices  Learniers will understand the significance about different voltage source converter based facts controllers  Learniers will be able to analyze on FACTS controller interaction and control coordination  To understand the basic concepts of FHV AC and HVEC transmission	¥	V	7			introduced	improving power quality for power sector applications  This Coarse is retained to establish	3-0-2	

Course Coile	Conrse Title	CO NO	Description of the Course Outcome	ŋ	b c	ď	e f	Con	iirse Type :	Rationle	L-T-P	Credi
	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	cor	Understand the accet of load compensation	χ <sup>i</sup>		Ц	T					
	Reactive Power	CD2	Analyze various reactive power compensation techniques	V.	1	Ц	1-		use modified	This Course is retained to enrich the	200	3
15 EE 51E1	Compensation		Understand reactive power coordination and demand side monagement		v				om carlier corculant	knowledge on restrictured power systems	3-0-0	'
	& Management	¢03,004	niusnate reactive power conitor requirements in contestic, traction and aic furnace systems	ď	Ň		N		Carculain			ļ
	Distribution	coi	Acquire in depth Knowledge on Load modeling and their characteristics	N'	1	┝╌	-		ırse modified	This Course is retained to curich the		}
	Distribution System	CO2	Acquire In depth Knowledge on Distribution feeders and transformers	Н	1	H	+		rom earlier	knowledge on planning &	3-0-0	3
15 EE 51E2	Planning &	CO3	Faults and protection schemes	1	ÝÝ	┝╌	+		curculam	automation of power systems		
	Automation	CO1	Aquire knowledge on Distribution Automation	_	v v	Ц	_ _	4				<del></del> -
		CO1	intended to provide a comprehensive treatment towards understanding of the now dimensions associated with the power systems	Ý	_	Н	1	4				
	-	CO2	he differences between the conventional power system operation and the restructured one, the course will prepare a background with fundamentals of microeconomics	M	4	Н	1		64.1	This Course is retained to enrich the		
	Power System Restructuring		the decion of newer markets and market prehitectural aspects, the changes in operational aspects	П	1	17	Т		irse medificd iom earlier	knowledge on restructuring &	3-0-0	3
15 EE 51F1	Desegulation &	CO3	with new operational chollenges like congestion management and ancillary service management	N		Ш			curculant	deregulation of power systems		
	Power Markets		will be claborated	H	+	$\vdash$	+	⊣ `	CULLININ	###B		
		CO4	efficient pricing of transmission network usage operation and Genco bidding strategies and market power with untigation techniques	V	ý							<u> </u>
	ļ. <del></del>	COI	Create invareness among students about Non-Conventional sources of energy	v	_	П						1
	Non	CO2	Enable students to understand various renewable energy technologies and systems.	V		П		Con	arse modified	This Course is modified to enhance the required skill set for utilising and		1
14 EE 4192	Conventional		To impart the knowledge of Storage technologies form the autonomous	П	7	П	Τ	fi	ìom earlier	integrating non-conventional energy	3-0-0	3
15 EE 51B2	Energy	CO3	renou plue energy stratees	Ш	` _	-	$\perp$	، إ	curculom	sources in power sector		
	Resources	ť04	Equip the students with knowledge and understanding of various possible mechanisms	付	- -	1	ŀ	√				<u> </u>
			about renewable curies urricots  Understand and analyze the basic concepts of Digital Signal Processing by MATLAB and number	Ħ	_	Ħ	1	1				
	ni seren .	cor	Understand and analyze the basic concepts of Digital Signal Processing by NACLEAD and minutes systems	Y	-	Ш	1	Con	urse modified	This Course is modified to establish		1
15 EE 51B1	Digital Signal Processor and	CO2	Understand and multyze various mehitectures for programmable DSP devices	17	V.		7		rom earlier	the required skill set for automation	3-(1-()	3
13 12 31 31	applications	CO3	Programming of TMS320F28335/F2812 Digital Signal Processor	П	v v			י [	curculam	industry in using DSP processors		
		£01	Application side of TMS320F28335/F2812 Digital Signal Processor		3							
	-	col	Create awareness among students about Non-Conventional sources of energy	$\overline{\mathbb{N}}$								
	Alternative	COZ	Understand and analyze the solar thermal applications and solar photovoltaic cells.	¥	×			Cou	urse modified	This Course is modified to enhance the required skill set for utilising and		}
15 EE 51F2	sources of electrical	C03	Analyze the performance of wind and tidal, wave and Ocean thermal energy conversion systems	v			_	1 0	irom carlier surculom	integrating reneweable energy sources in power sector	3-0-0	3
	caergy	соя	Understand and mudyze the operation of geothermal, bio and micro hydro energy conversion.	Ľ	Ý.							
	1	COI	Understand the need for energy conservation and various toriffs	1		$\mathbf{H}$	-	- Cou	arse modified	This Course is retained to establish		
	Energy	C02	Understand the muliting methods and their practice by case studies.	X	4	4-1	4		from earlier	the knowledge on Energy Auditing for employability in Energy &	3-0-0	] 3
15 EE 52G1	Conservation & Audit			П	V.	Ш			curculan	Autemation sector		1
	7,000	CO3	Apply the energy conservation techniques to motors, transformers, lighting systems.	1	Ц	Ш	4					<del> </del>
		1	and the state of t	v		4	- [-	Y.				
	1	l <u></u> -	Modelling and analysis of systems by identification approaches  Understand and analyze the operation of adaptive control techniques	k	H	+	+		urse modified	This Course is modified to enhance	3-0-0	] 3
15 EE 52G1	Adaptive	C02	1.1	Ť		1	-		from enriier cureulam	the adaptive controlling stratagies in power sector industry	3-0-0	'
	control systems	CO3	Evaluate the stability performance of adaptive control system for mitigating the parameter	$\perp$	Ì.	Щ	$\perp$		curculan	paner sector monany		
	1		variations.	┸	X.	4	_	1				
		COL	To understand the functioning of various devices in Smart Grids		X.	<u>\</u>		- Cou	halibone acum	This course is intended to acquire		
15 EE 52D1	Smart Grids	C02	To inderstand communication channels in Smart Grid.	1	Н	+	⊢∤-	- 1	from carlier	knowledeg on Smart grid technologies for power sector	3-0-0	
12 EE 52D1	Jumit Chats	CO3		1	Ľ.	+	$\vdash$	$\dashv$	curentam	applications		
			To apply knowledge in Smart Metering	1	낡	+	H					1
-	State	COI	Understanding the importance of probability in state estimation	1	├	- -	H	Н с	ourse modified	This Course is modified to enhance		
	Estimation &	CO2	Understanding and analyzing the adaptive control techniques Evaluating the stability performance of adaptive controllers	Ť	H	+-	H		from earlier	the estimation techniques and	3-0-0	
15 EE 52D2	Adaptive Centrol	c03	Exhibiting the automit beneamance in perfect communers	ķ				3 .	curculam	adaptive controlling stratagies in power electroni industry		
	<del> </del>	COL	Understand various power quality issues.	1	S				ourse modified	This Course is modified to enhance		1
		ÇO2	Analyze various power quality issues and its causes.	N	Ц	Ÿ.			from carlier	the knowledge on enhancement of	3-0-0	
15 EE 52C2	Power Quality	CO3	Analyze the different miligating techniques for valuage sog and swells.	14	Ш	_ _	Ц		enreulam	power quality techniques in industry		ĺ
		COt	Design and malyze voltage sag and swell using simulation tools.	1_	Į į	Ý.	Ц	<u> </u>				
		COI	Able to analyze embedded systems, its design cycle, modeling, layers of embedded systems		l	\						
		CO2	Able to understand Processor and Memory Organization and I/O Devices and Networks		Ϋ́	V.	Ц		ourse modified	This Course is medified to enhance the skill set on embedded systems to	3-0-0	
15EE52H2	Embedded		Able to understand, evaluate and select appropriate software architecture and analyze the features	1					from carlier curculam	control the power flow	3-0-11	
	Systems	CO3	real time operating systems  Understand various embedded system design methodologies and be able to develop and	+	╂═╂	+	Н	H	ententiun	Compariso posici cion	1	
		CO4	Understand various embedded system design memorinagies and oc ance to descrip and demonstrate a small embedded system for a real time application.	18	N			Ц			<u>l</u>	
			песионалис и этон спресодел зумень юго в тем инго офтисации.		••		ıL		~ //	-		

Professor & ...

Dept of EEE

K L Univarsity

Green Fields, Vaddeswaram,

Guntur Dt. A. P. Pin : 522 502

### K L UNIVERSITY

# DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING MINUTES OF DEPARTMENT ACADEMIC COMMITTEE MEETING

The Department Academic Committee meeting was conducted in E.E.E HOD, chamber on 10<sup>th</sup> September 2014 at 12.30 PM

### Agenda:

- 1. To discuss the feedbacks received from stake holders on curriculum
- 2. To propose the curriculum for B.Tech 2015-16 admitting batch
- 3. To propose the curriculum for M.Tech (PED & PS) 2015-16 admitting batch
- 4. Any other points with the permission of the DAC chairman

The following members were present:

- 1. Dr.M. Venu Gopal Rao, HoD & Head of DAC committee
- 2. Dr.O.Chandra Sekhar, PED Research Group Head
- 3. Mrs.S.V.N.L.Lalitha, PS Research Group Head
- 4. Dr.P.Linga Reddy, Professor, Department of EEE
- 5. Dr.G.Kesava Rao, Professor, Department of EEE
- 6. Dr.G.R.K.Murthy, Professor, Department of EEE
- 7. Prof.K.Subba Rao, Professor, Department of EEE

The following points were discussed, resolved and forwarded to Board of studies for considerations:

- 1. Up on feedback from Alumni, DAC members discussed about framing the syllabus in line with GATE syllabus.
- 2. Under Power Electronics & Drives specialization, the syllabus of the core courses was presented.
  - a. It is also resolved to include the following courses under the Power Electronics & Drives specialization (Annexure 2).
    - i. Modelling And Simulation Of Power Electronic Systems
    - ii. Industrial Applications Of Electronics
    - iii. Digital Signal Processing
    - iv. Power Quality
      - v. Advance PWM Techniques ·
- 3. Under Power Systems specialization, the syllabus of the core courses was presented.
  - a. It is also resolved to include the following courses under the Power System specialization (Annexure 2).
    - i. Advanced Power System Analysis
    - ii. Reactive Power Compensation & Management
    - iii. Power System Restructuring, Deregulation & Power Markets
    - iv. Energy Conservation & Audit

# . AI Techniques in Power Systems

- 4. Up on feedback from students & Industrial Peers, HoD has recommended Employability oriented courses to be included to enrich the placements.
  - a. It is also resolved to include the following changes in the courses of employability & communication skills (Annexure 1).
    - i. Rudiments of Communication Skills
    - ii. Interpersonal Communication Skills
    - iii. Professional Communication Skills
    - iv. Employability Skills
- 5. Up on feedback from External Faculty, DAC members recommended the following changes in the Basic science courses are
  - a) Form factor & Peak Factor Calculations for Aperiodic signals also in Fields & Networks Course (Annexure 1).
  - b) Cayley Hamilton theorem as a topic in single variable calculus & Matrix Algebra Course (Annexure 1).
  - c) Electrical Engineering measuring devices like Ammeter, Voltmeters & Bridges are to be included in Measurements course (Annexure 1).
  - d) Bridge Course of Introduction to Engineering is to be included as a noncredit course in curriculum to impart the importance of Engineering (Annexure 1).
- 6. Up on feedback from Course Coordinator, DAC members recommended the following changes in the Network theory course are
  - a. Two Port Networks, Transients & Graph Theory (Annexure 1).
- 7. Dr.Y.P.Obulesu, tabled the syllabus of Hybrid Electric Vehicles in the power electronic engineering stream, DAC members recommended to incorporate this course in to the curriculum.
- 8. Upon considering above mentioned feedbacks, it is resolved to propose enclosed Program development documents and curriculum for B.Tech-Electrical Engineering Program for 2015-16 for BOS approval (Annexure 1).
- 9. Upon considering above mentioned feedbacks, it is resolved to propose enclosed Program development documents and curriculum for M.Tech-Electrical & Electronics Engineering Program for 2015-16 for BOS approval (Annexure 2).

Dr.M. Vend Copal Rao (Head of the Department)

Dept of EEE

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# K L University <u>Department of ELECTRICAL & ELECTRONICS Engineering</u> <u>Department Academic Committee (DAC)</u>

The following members attended the meeting on 10<sup>th</sup> September 2014 at 1:00 pm:

S.No	Name of the member	Designation	Signature
1	Dr.M.Venu Gopal Rao	Professor, HOD	Juan Juan Juan Juan Juan Juan Juan Juan
2	Dr.O.Chandra Sekhar	Professor	
3	Dr.P.Lingareddy	Professor	&
4	Dr.G.R.K.Murthy	Professor	Skarty.
5	Dr.G.Kesava Rao	Professor	you
6	Prof.K.Subbarao	Professor	Mun
7	Mrs.S.V.N.L.Lalitha	Associate Professor	

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	Departme	nt of Elect	rical &	Electronics En littee Meeting (1	gincering
	Annexure 1:	Proposed	B.Tech	2015-16 Cours	se Structure
S.No	Course Name	L-T-P	Cr	Pre-Req.	Remarks
I	HUMANITIES & SOCIAL SCIENCES		•		
· I	Ecology and Environment	2-0-0	2	NIL	Nii
2	Human Values	2-0-0	2	NIL	Nil
3	Rudiments of Communication Skills	2-0-0	2	NIL	Topic Modified: Imparting Rudiments of Communication skills
4	Interpersonal Communication Skills	2-0-0	2	NIL	Topic Modified: Incorporaale topics to enhance interpersonal Communication skills
5	Professional Communication Skills	0-0-4	2	NIL	Topic Modified: Incorporate topics to enhance Professional Communication skills
6	Employability Skills	0-0-4	2	NIL	Topic Modified: Imparting Employability acquiring skills and opurtunities
7	Verbal and Quantitative Reasoning	0-0-4	2	NIL	New Course
8	Corporate Communication Skills	0-0-4	2	NIL	New Course
11	BASIC SCIENCES	•			
1	Single Variable calculus and Matrix Algebra	2-22	4	NIL	Topic Added: Matrix Algebra- Cayley Hamilton Theorem
2	Mechanics	2-22	4	NIL	Topic Modified: Project Based lab Implementation to Enhance the Programming Skills
3	Engineering Materials	2-22	4	NIL	Topic Modified: Project Based lab Implementation to Enhance the Programming Skills
4	Engineering Chemistry	2-22	4	NIĹ	Topic Modified: Project Based lab Implementation to Enhance the Programming Skills
5	Biology for Engineers	2-0-0	2	NIL	Topic Modified: Project Based lab Implementation to Enhance the Programming Skills
6	Fields & Networks	2-22	4	NIL	Topic Added: Form Factor & Penk Factor for Aperiodic Signals
III	ENGINEERING SCIENCES				
1	C Programming & Data Structures	2-42	5	NIL	New Course
2	Engineering Graphics	0-0-6	3	NIL	Nil
3	Measurements	0-0-4	2	NIL	Topic Modified: Electrical Engineering Measuremts Like Ammeter, Voltmenters & Bridges
4	Introduction to Engineering	2-0-2	3	'NIL	New Course
. 5	Object Oriented Programming	2-22	4	NIL	Topic Modified: Project Based lab Implementation
6	Signal Analysis	2-22	4	NIL	Topic Modified: Project Based lab Implementation
7	Discrete Mathematics	2-22	4	NIL	Topic Modified: Project Based lab Implementation

PROFESSIONAL CORE COURSES		S.No	Course Name	L-T-P	Cr	Pre-Req.	Remarks	
2 Computer Organization and Architecture 2-2-2 4 NIL Topic Modified: Project Based Inh Implementation Topics Addited Two Pears State In Implementation Topics Addited: Two Pears State In Implementation Topics Modified: Project Based Inh Implementation Topic Modified: Project Based Inh Implementation Topic Modified: Project Based Inh Implementation Topic Modified: Project Based Inh Implementation Transformers Topic Modified: Project Based Inh Implementation Topic Modified:		IV	PROFESSIONAL CORE COURSES	3				
2-2-2 4 Fields & Networks Topic Modified: Project Based lab Implementation NIL Topic Modified: Project Based lab Implementation Topic Modified: Project Based lab Implementation NIL Topic Modified: Project Based lab Implementation Octorrol Systems NIL Topic Modified: Project Based lab Implementation Octorrol Systems NIL Topic Modified: Project Based lab Implementation Octorrol Systems NIL Topic Modified: Project Based lab Implementation Obstribution Octorrol Systems NIL Topic Modified: Project Based lab Implementation Octorrol Systems NIL Topic Modified: Project Based lab Implementation Octorrol Systems NIL Topic Modified: Project Based lab Implementation Octorrol Systems NIL Topic Modified: Project Based lab Implementation Octorrol Systems Protection Octorrol Systems Protection NIL Topic Modified: Project Based lab Implementation Octorrol Systems Protection NIL Topic Modified: Project Based lab Implementation Octorrol Systems Protection Octorrol Systems Protection NIL Topic Modified: Project Based lab Implementation Octorrol Systems Project Based lab Implementation Octorrol Systems Project Based lab Implementation NIL Topic Modified: Project Based lab Implementation Octorrol Systems Project Based lab Implementation NIL Topic Modified: Project Based lab Implementation Octorrol Systems Project Based lab Implementation NIL Topic Modified: Project Based lab Implementation NIL Topic Modified: Project Bas	-	1	Digital System Design	2-22	4	NIL	Topic Modified: Project Based lab Implementation	
Autorial Circuit   Section   Secti		2	Computer Organization and Architecture	2-22	4	NIL	Topic Modified: Project Based lab Implementation	
2		3	Electrical Circuits	2-22	4	Fields & Networks	Topic Modified: Project Based lab Implementation Topics Added: Two Port Networks, Graph Theory & Transients	
Processors and Controllers   2-22   4   NIL   Topic Modified: Project Based lab Implementation		4	Analog Electronic Circuit Design	2-22	4	NIL	Topic Modified: Project Based lab Implementation	
7 AC Machines 2-2-2 4 Transificant and Transformers Topic Modified: Project Based lab Implementation  8 Signal Processing 2-22 4 Signal Analysis Topic Modified: Project Based lab Implementation  9 Generation, Transmission & Distribution 2-22 4 NIL Topic Modified: Project Based lab Implementation  10 Control Systems 2-22 4 NIL Topic Modified: Project Based lab Implementation  11 Power System Analysis 2-22 4 Richard Transmission & Distribution Topic Modified: Project Based lab Implementation  12 Power Electronics 2-22 4 Electrical Circuits Topic Modified: Project Based lab Implementation  13 Power System Protection 2-22 4 Electrical Circuits Topic Modified: Project Based lab Implementation  14 Electrical Drives 2-22 4 Power Electronics Topic Modified: Project Based lab Implementation  17 PROFESSIONAL ELECTIVES  Power Electronics Specialization Topic Modified: Project Based lab Implementation  1 Advanced Electrical Drives 3-0-0 3 Power Electronics Nil  2 Advanced Electrical Drives 3-0-0 3 Electrical Drives Nil  4 Power Quality 3-0-0 3 NIL Nil  5 Hybrid Electrical Vehicles 3-0-0 3 Electrical Drives New Course  Power Systems Specialization  1 Distribution System Planning & Automation 3-0-0 3 NIL Nil  1 Distribution System Planning & Automation 3-0-0 3 NIL Nil	- 	5	DC Machines and Transformers	2-22	4	Electrical Circuits	Topic Modified: Project Based lab Implementation	
7   AC Machines   2.2-2   4   Transformers   Tran	F	6	Processors and Controllers	2-22	4	NIL	Topic Modified: Project Based lab Implementation	•
9 Generation, Transmission & Distribution 2-22 4 NIL Topic Modified: Project Based lab Implementation 10 Control Systems 2-2-2 4 NIL Topic Modified: Project Based lab Implementation 11 Power System Analysis 2-22 4 NIL Topic Modified: Project Based lab Implementation 12 Power Electronics 2-22 4 Electrical Circuits 13 Power System Protection 2-22 4 Electrical Circuits 14 Electrical Drives 2-22 4 Power Electronics 15 Prover Electronics 2-22 4 Power Electronics 16 Prover Electronics 17 PROFESSIONAL ELECTIVES 18 Power Electronics Specialization 19 Advanced Power Electronics 3-0-0 3 Power Electronics 3-0-0 3 NIL Nil 4 Power Quality 3-0-0 3 NIL Nil 5 Hybrid Electrical Vehicles 3-0-0 3 Electrical Drives 3-0-0 3 NIL Nil 5 Hybrid Electrical Vehicles 4 Distribution 1 Distribution 3-0-0 3 Nil Nil 5 Hybrid Electrical Vehicles 3-0-0 3 Nil Nil 5 Hybrid Electrical Vehicles 3-0-0 3 Nil 6 Nil Nil 7 Nil Nil 7 Nil Nil 8 Nil Nil 8 Nil Nil 8 Distribution System Planning & Automation 1 Distribution System Planning & Automation 3 Nil Nil		7	AC Machines	2~22	4		Topic Modified: Project Based lab Implementation	
10 Control Systems 2.22 4 NIL Topic Modified: Project Based lab Implementation  11 Power System Analysis 2.22 4 Distribution  12 Power Electronics 2.22 4 Electrical Circuits Topic Modified: Project Based lab Implementation  13 Power System Protection 2.22 4 Electrical Circuits Topic Modified: Project Based lab Implementation  14 Electrical Drives 2.22 4 Electrical Circuits Topic Modified: Project Based lab Implementation  15 Power System Protection 2.22 4 Power Electronics Topic Modified: Project Based lab Implementation  16 Electrical Drives 2.22 4 Power Electronics Topic Modified: Project Based lab Implementation  17 Professional Electricies  18 Power Electronics Specialization  19 Advanced Power Electronics 3.0-0 3 Power Electronics Nil  20 Advanced Electricial Drives 3.0-0 3 Electrical Drives Nil  3 HVDC & FACTS 3.0-0 3 NIL Nil  4 Power Quality 3.0-0 3 Electrical Drives New Course  Power Systems Specialization  1 Distribution System Planning & Automation 3.0-0 3 Nil Nil Nil  1 Distribution System Planning & Automation 3.0-0 3 Nil Nil Nil	;	8	Signal Processing	2-22	4	Signal Analysis	Topic Modified: Project Based lab Implementation	
11 Power System Analysis 2-22 4 Transmission & Distribution 12 Power Electronics 2-22 4 Electrical Circuits Topic Modified: Project Based lab Implementation 13 Power System Protection 2-22 4 Electrical Circuits Topic Modified: Project Based lab Implementation 14 Electrical Drives 2-22 4 Power Electronics Topic Modified: Project Based lab Implementation 15 Professional Electrical Drives 16 Power Electronics 17 Professional Electrical Drives 18 Power Electronics 19 Advanced Power Electronics 10 Advanced Electrical Drives 10 Advanced Electrical Drives 10 Advanced Electrical Drives 11 Advanced Electrical Drives 12 Advanced Electronics 13 HVDC & FACTS 14 Power Quality 15 Hybrid Electrical Vehicles 15 Hybrid Electrical Vehicles 16 Distribution System Planning & Automation 17 Distribution System Planning & Automation 18 Distribution System Planning & Automation 19 Automatical Project Based lab Implementation 10 Transmission & Topic Modified: Project Based lab Implementation 10 Transmission & Topic Modified: Project Based lab Implementation 11 Topic Modified: Project Based lab Implementation 12 Topic Modified: Project Based lab Implementation 12 Topic Modified: Project Based lab Implementation 14 Electrical Drives 15 Topic Modified: Project Based lab Implementation 16 Topic Modified: Project Based lab Implementation 17 Topic Modified: Project Based lab Implementation 18 Topic Modified: Project Based lab Implementation 19 Topic Modified: Project Based lab Implementation 10 Topic Modified: Project Based		9	Generation, Transmission & Distribution	2-22	4	NIL	Topic Modified: Project Based lab Implementation	
11   Power System Analysis   2-22   4   Transmission & Distribution   Topic Modified: Project Based lab Implementation     12   Power Electronics   2-22   4   Electrical Circuits   Topic Modified: Project Based lab Implementation     13   Power System Protection   2-22   4   Electrical Circuits   Topic Modified: Project Based lab Implementation     14   Electrical Drives   2-22   4   Power Electronics   Topic Modified: Project Based lab Implementation     17   PROFESSIONAL ELECTIVES   Power Electronics   Topic Modified: Project Based lab Implementation     1   Advanced Power Electronics   3-0-0   3   Power Electronics   Nil     2   Advanced Electrical Drives   3-0-0   3   Electrical Drives   Nil     3   HVDC & FACTS   3-0-0   3   NIL   Nil     4   Power Quality   3-0-0   3   Electrical Drives   New Course     1   Distribution System Planning & Automation   3-0-0   3   NIL   Nil     1   Distribution System Planning & Automation   3-0-0   3   NIL   Nil     1   Distribution System Planning & Automation   3-0-0   3   NIL   Nil     1   Distribution System Planning & Automation   3-0-0   3   NIL   Nil   Nil     2   Nil   Nil   Nil   Nil   Nil   Nil   Nil   Nil     2   Nil	-	10	Control Systems	2-22	4	NIL	Topic Modified: Project Based lab Implementation	
13   Power System Protection   2-22   4   Transmission & Distribution     14   Electrical Drives   2-22   4   Power Electronics   Topic Modified: Project Based lab Implementation     1V   PROFESSIONAL ELECTIVES   Power Electronics   Topic Modified: Project Based lab Implementation     1   Advanced Power Electronics   3-0-0   3   Power Electronics   Nil     2   Advanced Electrical Drives   3-0-0   3   Electrical Drives   Nil     3   HVDC & FACTS   3-0-0   3   NIL   Nil     4   Power Quality   3-0-0   3   Electrical Drives   New Course     4   Power Systems Specialization   1   Distribution System Planning & Automation   3-0-0   3   NIL   Nil     5   Power Systems Specialization   1   Distribution System Planning & Automation   3-0-0   3   NIL   Nil     6   Nil   Nil   Nil   Nil   Nil     7   Nil   Nil   Nil   Nil   Nil   Nil   Nil     7   Nil   Nil   Nil   Nil   Nil   Nil   Nil   Nil   Nil     7   Nil   Nil   Nil   Nil   Nil   Nil   Nil   Nil   Nil     7   Nil   Ni	3	11	Power System Analysis	2-22	4	Transmission &	Topic Modified: Project Based lab Implementation	
Power System Protection   2-22   4   Transmission & Distribution   Topic Modified: Project Based lab Implementation		12	Power Electronics	2-22	4	Electrical Circuits	Topic Modified: Project Based lab Implementation	
1V PROFESSIONAL ELECTIVES  Power Electronics Specialization  1 Advanced Power Electronics 3-0-0 3 Power Electronics Nil  2 Advanced Electrical Drives 3-0-0 3 Electrical Drives Nil  3 HVDC & FACTS 3-0-0 3 NIL Nil  4 Power Quality 3-0-0 3 NIL Nil  5 Hybrid Electrical Vehicles 3-0-0 3 Electrical Drives New Course  Power Systems Specialization  1 Distribution System Planning & Automation 3-0-0 3 NIL Nil		13	Power System Protection	2-22	4	Transmission &	Topic Modified: Project Based lab Implementation	
Power Electronics Specialization  1 Advanced Power Electronics 3-0-0 3 Power Electronics Nil  2 Advanced Electrical Drives 3-0-0 3 Electrical Drives Nii  3 HVDC & FACTS 3-0-0 3 NIL Nil  4 Power Quality 3-0-0 3 NIL Nil  5 Hybrid Electrical Vehicles 3-0-0 3 Electrical Drives New Course  Power Systems Specialization  1 Distribution System Planning & Automation 3-0-0 3 NiL Nil		[4	Electrical Drives	2-22	4	Power Electronics	Topic Modified: Project Based lab Implementation	-
1 Advanced Power Electronics 3-0-0 3 Power Electronics Nil 2 Advanced Electrical Drives 3-0-0 3 Electrical Drives Nil 3 HVDC & FACTS 3-0-0 3 NIL Nil 4 Power Quality 3-0-0 3 NIL Nil 5 Hybrid Electrical Vehicles 3-0-0 3 Electrical Drives New Course  Power Systems Specialization 1 Distribution System Planning & Automation 3-0-0 3 NIL Nil		IV	PROFESSIONAL ELECTIVE	S 100 mg/m				-
2 Advanced Electrical Drives 3-0-0 3 Electrical Drives Nii  3 HVDC & FACTS 3-0-0 3 NIL Nil  4 Power Quality 3-0-0 3 NIL Nil  5 Hybrid Electrical Vehicles 3-0-0 3 Electrical Drives New Course  Power Systems Specialization  1 Distribution System Planning & Automation 3-0-0 3 NIL Nil		Power	Electronics Specialization					-
2   Advanced Electrical Drives   3-0-0   3   NIL   Nil		1	Advanced Power Electronics	3-0-0	3	Power Electronics	Nil	_
4 Power Quality 3-0-0 3 NIL Nil  5 Hybrid Electrical Vehicles 3-0-0 3 Electrical Drives New Course  Power Systems Specialization  1 Distribution System Planning & Automation 3-0-0 3 NIL Nil		ż	Advanced Electrical Drives	3-0-0	3	Electrical Drives	Nil	_
5 Hybrid Electrical Vehicles 3-0-0 3 Electrical Drives New Course  Power Systems Specialization  1 Distribution System Planning & Automation 3-0-0 3 NIL Nil	t, -	3	HVDC & FACTS	3-0-0	3	NIL	, Nil	
1   Distribution System Planning & Automation   3-0-0   3   Electrical Drives   New Course		4	Power Quality	3-0-0	3	NIL	. Nil	
1 Distribution System Planning & Automation / 3-0-0 3 NIL Nil		. 5	Hybrid Electrical Vehicles	3-0-0	3	Electrical Drives	· New Course	_
1 Distribution System Planning & Automation 5-0-0 3 1705		Power	Systems Specialization	•			•	
	. •	ı	Distribution System Planning & Automation	3-0-0	3	NIL	Nil	
		2	Restructured Power Systems	3-0-0	3	NIL	Nil	
3 HVDC & FACTS 3-0-0 3 NIL Nil		3	HVDC & FACTS	3-0-0	3	ЫГ	, Nil	
4 Power Quality 3-0-0 3 NIL Nil		4	Power Quality	3-0-0	3	NIL	Nil	_
. 5 Smart Grid Technologies 3-0-0 3 NIL Nil		5	Smart Grid Technologies	3-0-0	3	NIL	, Nil	_

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No. of Courses Modifed: 38 No. of Courses Offered: 61	No.of New Courses Added :	6
No.of Courses Offered: 61		
	Percentage of Syllabus Revision:	

	KL				
	Department of Electrical &	& Electron	nics En	gineering	
	Department Academic Com	mittee Me	eting (	10/10/2014)	
	Annexure 2: Proposed M.Tech-	PED- 201	5-16 C	ourse Structure	
S.No	Course Name	L-T-P	Cr	Pre-Req.	Remarks
	Professional	Core Courses	3		NIL.
	DESIGN OF POWER CONVERTERS	3-0-2	4	NIL	NIL NIL
1	POWER ELECTRONIC CONTROL OF DRIVES	3-2-2	4	NIL	NIL
	OPTIMIZATION TECHNIQUES	3-0-2	4	NIL	NIL
3	MODERN CONTROL THEORY	3-2-0	4	NIL	NIL
5	ADVANCED POWER CONVERTERS	3-2-2	4	NIL	NIL
6	MICRO CONTROLL FILS AND EMBEDDED SYSTEMS	3-2-0	4	NIL	New Course
7	MODELLING AND SIMULATION OF POWER ELECTRONIC SYSTEMS	3-2-0	4	NIL	New Course
8	A ARTICLE ON OF ELECTRONICS	3-2-0	4	NIL	non comes
8	INDUSTRIAL APPLICATIONS OF ELECTRONICS  Professional E			NIII T	NIL
<del></del>	INSTRUMENTATION & CONTROL	3-0-0	3	NIL	NIL
2	CDECIAL MACHINES	3-0-0	3	NIL NIL	NIL
3	ELECTRIC AND HYBRID VEHICLES	3-0-0	3	NIL NIL	New Course
4	IDICITAL SIGNAL PROCESSING	3-0-0	3	NIL .	NIL
5	NON-CONVENTAIONAL ENERGY RESOURCES	3-0-0	3	NIL NIL	NIL
6	FACTS	3-0-0	3	NIL ·	New Course
7	POWER QUALITY	3-0-0	3	NIL	NIL
8	SMART GRIDS	3-0-0	3	NIL NIL	NIL
9	STATE ESTIMATION & ADAPTIVE CONTROL	3-0-0	3_	, NIL	New Course
10	A DAVANCE DUM TECHNIQUES	3-0-0	3	NIL NIL	NIL '
11	TALTECHNIQUES IN POWER ELECTRONICS & DIGVES	3-0-0	3_	NIL NIL	NIL
12	TEMPEDDED CONTROL OF ELECTRIC DRIVES	3-0-0	3_	I NIL	
	Pi	rojects	1 2	NIL	NIL
	Seminar	0-0-4	2	NIL	NIL
_ <del></del>	Term Paper	0-0-4	36	NIL	NIL
3	Dissertation	0-0-72	. 30	INII.	

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	Department of Electrical &	& Electron	ies En	gineering	
	Department Academic Comi	nittee Me	eting (	10/10/2014)	
Annexure 2: Proposed M. Tech 2015-16 Course Structure					
S.No	Course Name	L-T-P	Cr	Pre-Req.	Remarks
5.110	Professional C	Core Courses			NIL
		3-0-2	4	NIL NIL	New Course
_!	Power System Dynamics & stability	3-2-2	4	NIL	New Course NIL
_2	Advanced Power System Analysis	3-0-2	4	NIL	NIL NIL
3	Optimization Techniques	3-2-0	4	NIL	NIL
4	Modern Control theory	3-2-2	4	NIL	NIL NIL
_5	Real Time Control of Power System	3-2-0	4	NIL	NIL NIL
6	Micro Controllers & Embedded Systems EHVAC & HVDC Transmission	3-2-0	4	NIL	NIL NIL
	nt to the continu	3-2-0	4	NIL	INIL
8	Power Systems Digital Protection Professional E	letetive Cours	ses		New Course
	Reactive Power Compensation & Management	3-0-0	3	NIL	NIL .
<u> </u>	Distribution System Planning & Automation	3-0-0	3	NIL	NIL
2	Power System Reliability	3-0-0	3	NII.	New Course
3	Power System Restructuring, Deregulation & Power Markets	3-0-0	3	NIL	New Course
4	Energy Conservation & Audit	3-0-0	3	NIL	New Course
5	Al Techniques in Power Systems	3-0-0	3	NIL	NII
6	DIGITAL SIGNAL PROCESSING	3-0-0	3	NIL	, NIL
7	NON-CONVENTAIONAL ENERGY RESOURCES	3-0-0	3	NIL	NIL
8	FACTS	3-0-0	3	NIL	NIL
	POWER QUALITY	3-0-0	3	NIL	NIL ·
10	SMART GRIDS	3-0-0	3	NIL	NIL
11	STATE ESTIMATION & ADAPTIVE CONTROL	3-0-0	3_	NIL	NID
		ojects	L		
		0-0-4	$\overline{}$	NIL	NIL
	Seminar	0-0-4	2	NiL	NIL
2	Term Paper	0-0-72	36	NIL	NIL
3	Dissertation	0-0-72	<del>//</del>		