KUPPAM ENGINEERING COLLEGE

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

M-Tech Power electronics (R-21)

I Year I Sem

Subject code:21D54101						Subject Name: SWITCHED MODE POWER CONVERTERS
CO1	Remember and Understand the concept of advanced converter topologies.					
CO2	Apply the concept of topologies for various switching regulators.					
CO3	Analyse the working and waveforms of the converters designed.					
CO4	Analyse the concepts of half & full bridge converter topologies					
CO5	Evaluatetheoperationofcontinuousanddis-continuousFlybackconverter topologies					
POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	2	2	3	2	2	3
CO 2	2	2	3	2	2	3
CO 3	2	2	3	2	2	3
CO 4	2	2	3	3	2	3
CO 5	1	2	3	3	2	3

P. [signature]
Program Co-ordinator

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I Year I Sem

Subject code: 21D54102	**Subject Name: MACHINE MODELLING & ANALYSIS**

CO1	Understand the Concept Magnetically Coupled Circuits, Types of DC machines, Commonly used Reference Frames, machines variables, Time domain and state equations, Permanent Magnet Brushless DC Motor Operating principle.
CO2	Apply the concept of Change of Variables and Transformation to an Arbitrary Reference Frame, Equal Area Criteria.
CO3	Analyse the dynamic analysis of machines. .
CO4	Analyze the Free Acceleration Characteristics viewed from Various Reference Frames, Steady-State Analysis and its Operation ,dynamic analysis of machines, Mathematical modeling of PM Brushless DC motor.
CO5	Design the modelling of DC machines, Three phase Induction machines, Synchronous machine.

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	2	2	3	2	2	3
CO 2	2	2	2	2	2	2
CO 3	2	2	3	2	3	3
CO 4	1	2	3	2	2	2
CO 5	2	1	3	2	2	3

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I Year I Sem

Subject code: 21D54103a	**Subject Name: POWER ELECTRONIC CONTROL OF DC DRIVES**

CO1	Remember and understand the concept Separately excited single phase and three phase rectifier with DC Motor load drives.
CO2	Apply the concept of phase controlled technique for DC motor Drives.
CO3	Analyse the current and speed controlled Drives.
CO4	Analyze the operations when various controlling techniques are applied on DC motor drives.
CO5	Design of chopper controlled DC motor Drives in various quadrants.

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	2	2	3	2	2	2
CO 2	2	2	2	2	2	2
CO 3	3	2	3	2	2	2
CO 4	3	2	3	2	2	2
CO 5	2	2	2	2	2	3

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I Year I Sem

Subject code: 21D54104a	**Subject Name: SOLAR ENERGY CONVERSION SYSTEMS**

CO1	Understand the fundamentals of solar cell, Solar PV Modules from solar cells, system types, Standalone PV system configuration, Maximum Power Point tracking (MPPT).
CO2	Apply the concept of various technologies of solar PV cells, manufacture, sizing and operating techniques.
CO3	Number of solar cells in a module-Wattage of modules- Fabrication of PV module–PV module power output.
CO4	Analyse the concept of Effect of series and shunt resistance on efficiency, Effect of solar radiation on efficiency, Analytical techniques, Hot spots in the module, Algorithms for MPPT.
CO5	Design of PV powered DC fan without battery, Standalone system with DC load using MPPT, PV powered DC pump, standalone system with battery and AC/DC load.

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	2	2	2	2	3	3
CO 2	3	2	3	3	3	3
CO 3	3	2	3	3	3	3
CO 4	3	2	3	3	3	3
CO 5	3	2	2	3	2	3

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I Year I Sem

Subject code: 21D54105	**Subject Name: POWER ELECTRONICS CIRCUITS LAB**

CO1	Understand the basic concept and its operation of Power Electronic converters
CO2	Analyse the output waveforms of the various converters designed
CO3	Apply the MATLAB/ Simulink for various controllers
CO4	Apply mathematical relations to find THD and verify it practically
CO5	Design different controllers using Simulink

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	2	3	3	3
CO2	2	2	2	3	3	3
CO3	3	2	2	3	3	3
CO4	3	3	2	3	2	2
CO5	3	2	3	3	3	2

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I Year I Sem

Subject code: 21D49205	**Subject Name: RENEWABLE ENERGY SYSTEMS LAB**

CO1	To observe the I-V and P-V curves and Series and Parallel connection of Solar systems
CO2	Apply the SVC,STATCOM for voltage profile improvements & UPFC in power system networks.
CO3	To study the sun tracking and MPPT Charge Controllers of Solar systems
CO4	To analyse Power, Voltage & Frequency Measurement of Wind Generator
CO5	To Understand the Effect of temperature variation and Irradiation on Photovoltaic Array

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	3	3	3	2
CO2	3	2	3	3	2	3
CO3	3	2	3	3	3	2
CO4	2	2	3	2	2	2
CO5	2	2	3	2	2	2

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I Year I Sem

Subject code: 21DRM101	**Subject Name: RESEARCH METHODOLOGY AND IPR**

CO1	Analyse research related information .
CO2	Follow research ethics
CO3	Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.
CO4	Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.
CO5	Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	3	2	2	2	3	3
CO 2	3	2	3	3	3	3
CO 3	3	2	2	3	3	3
CO 4	3	2	3	3	3	3
CO 5	3	2	3	3	3	3

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I Year I Sem

Subject code: 21DAC101a	**Subject Name: ENGLISH FOR RESEARCH PAPER WRITING**

CO1	Understand the significance of writing skills and the level of readability
CO2	Learn about what to write in each section
CO3	Analyse and write title, abstract, different sections in research paper
CO4	Ensure qualitative presentation with linguistic accuracy
CO5	Develop the skills needed while writing a research paper

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	2	2	2	3
CO2	2	2	2	2	2	3
CO3	2	3	3	2	3	3
CO4	2	2	3	2	2	3
CO5	2	3	2	2	3	3

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I YEAR/II SEM

Subject code: 21D54201	**Subject Name: MODERN POWER ELECTRONICS**

CO1	Understand the characteristics of various power semiconductor devices.
CO2	Analyse the operation of various types of resonant pulse inverters, resonant converters and multi inverters.
CO3	Evaluation of L and C for zero current switching inverter
CO4	Analyse various pulse modulation and advanced modulation techniques available.
CO5	Apply the above concepts to choose appropriate device for particular topology.

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	2	3	3	3	3	3
CO 2	3	2	3	3	2	3
CO 3	2	2	2	3	2	3
CO 4	2	2	3	3	3	3
CO 5	3	3	2	3	2	3

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I YEAR/II SEM

Subject code:21D49202	**Subject Name: FACTS CONTROLLERS**

CO1	Understand various control techniques for the purpose of identifying the scope and for selection of specific FACTS controllers.
CO2	Remember different types of controllable VAR generation and variable impedance techniques.
CO3	To remember the objectives of Shunt and Series compensation
CO4	Design simple converters using FACTS controllers.
CO5	Understand the operation of Unified Power Controller and Hybrid Arrangements.

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	3	3	2	3
CO2	3	2	2	3	2	3
CO3	3	2	3	3	2	2
CO4	3	2	2	2	2	2
CO5	3	2	3	2	2	3

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I YEAR/II SEM

Subject code:21D54202b	**Subject Name: ADVANCED POWER SEMICONDUCTOR DEVICES AND PROTECTION**

CO1	To understand the characteristics of various power semiconductor devices such as BJT, MOSFET, GTO and IGBT
CO2	Apply the above to understand the various types of emerging power semiconductor devices
CO3	Apply the basics of above to understand the various types of emerging power semiconductor devices such as power JFET and MOS controlled thyristor.
CO4	To analyse the concept of Electro Magnetic Interference, Noise, their sources and effect of them on electronic equipment.
CO5	To design protection devices and circuits like heat sinks, voltage and current protection circuits.

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	3	2	3	2	2	3
CO 2	2	3	3	3	3	3
CO 3	2	3	2	2	2	3
CO 4	3	2	2	3	3	3
CO 5	2	3	3	2	2	3

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I YEAR/II SEM

Subject code:21D49204a						Subject Name: POWER QUALITY
CO1	Understand the fundamentals & terminology of power quality.					
CO2	Apply the concept of power frequency disturbances, types of transients & transient waveforms.					
CO3	Analyse the harmonic methodology & Electromagnetic Interference concepts.					
CO4	Remember the necessity of grounding and methods of grounding.					
CO5	Understand different techniques of measuring & solving power quality problems					
POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	1	2	2	2	3	3
CO 2	1	2	2	3	3	2
CO 3	1	2	2	2	3	3
CO 4	3	2	2	3	3	2
CO 5	3	2	2	2	3	2

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I YEAR/II SEM

Subject code:21D54204	**Subject Name: ELECTRIC DRIVES LAB**

CO1	To get practical training and hand on for the hardware and software application used in electric drives.
CO2	Apply and analyse various modulation techniques on different drives.
CO3	To understand the practical problems and limitations of the methods used in electric drives
CO4	Apply and analyse various modulation techniques on different motor drives.
CO5	Analyse performance of Induction Motors when different converters are connected.

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	2	2	3	2	2	2
CO 2	2	2	2	2	2	3
CO 3	3	2	3	2	2	2
CO 4	3	2	2	2	2	3
CO 5	3	2	3	2	2	2

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I YEAR/II SEM

Subject code: 21D49206	**Subject Name: FACTS DEVICES & SIMULATION LAB**

CO1	Understand Load balancing using compensators.
CO2	Apply the SVC, STATCOM for voltage profile improvements & UPFC in power system networks.
CO3	Apply load balancing using Compensators.
CO4	Analyse load flow incorporating SVC & STATCOM.
CO5	Develop a Simulation model for STATCOM & UPFC.

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	2	3	2	3	3	3
CO 2	3	2	3	2	3	2
CO 3	2	3	3	2	2	2
CO 4	2	2	2	3	3	3
CO 5	2	3	2	3	2	3

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I YEAR/II SEM

Subject code:21DAC201b	**Subject Name: STRESSMANAGEMENT BY YOGA**

CO1	Develop healthy mind in a healthy body thus improving social health also
CO2	To overcome stress
CO3	Do's and Don'ts's in life.
CO4	Asan and Pranayama
CO5	Improve efficiency.

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	2	2	2	2	2	2
CO 2	2	2	2	2	2	2
CO 3	2	3	2	3	2	2
CO 4	2	3	2	3	2	2
CO 5	2	3	3	2	2	2

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II YEAR III SEM

Subject code:21D54301a						Subject Name: CONTROL & INTEGRATION OF RENEWABLE ENERGY SOURCES
CO1	Knowledge on different renewable energy sources and storage devices.					
CO2	To learn the principles of generating Heat Energy and Electrical energy from Non-conventional / Renewable Energy Sources.					
CO3	Recognize, model and simulate different renewable energy sources.					
CO4	To gain understanding of Control issues and challenges in various types of generators					
CO5	Analyse, model and simulate basic control strategies required for grid connection.					
POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	3	2	3	2	3	3
CO 2	2	2	3	2	2	2
CO 3	3	2	3	2	3	2
CO 4	2	2	3	2	2	3
CO 5	3	2	2	2	3	3

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II YEAR III SEM

Subject code:21DOE301e	**Subject Name: WASTE TO ENERGY**

CO1	To know about overview of Energy to waste and classification of waste.
CO2	To acquire knowledge on bio mass pyrolysis, gasification, combustion and conversion process in detail.
CO3	Equilibrium and kinetic consideration in gratifier operation
CO4	Fixed bed combustors, Types, inclined grate combustors, Fluidized bed combustors, Design, construction and operation
CO5	To gain knowledge on properties of biogas, biomass resources and programmes to convert waste to energy in India.

POs / Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	3	3	2	2	3	3
CO 2	3	3	2	3	2	3
CO 3	2	3	2	3	2	2
CO 4	2	3	2	3	2	2
CO 5	2	3	3	2	2	3

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II YEAR IV SEM

Subject code:21D54401	**Subject name: Project work**

CO1	Analyse the problem, formulation and solution of the selected project
CO2	Develop solutions for contemporary problems using modern tools for sustainable development.
CO3	Demonstrate ethical and professional sustainability while working in a team and communicate effectively for the benefit of the society.
CO4	Understand the engineering, finance and management principles.
CO5	Design and develop of electrical equipment's for domestic, industrial and agricultural needs

POs / COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	2	3		
CO2	3	3	3	2	3	3
CO3	3	3	3	2		2
CO4	3	3	3	2	3	
CO5	3	3	3			

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