Lesson Plan

Name of Faculty : Mr. Amit Kaushik

Discipline : Electrical Engineering

Semester : 6th

Subject : Computer Aided Electrical Machine design

Lesson Plan Duration : 11 week (January 2018 to April 2018)

Work load (Lecture/Practical) per week (in hours): Lecture-03, Tutorial-03, Practical-02

Week	Theory		Practical	
	Lecture Day	Topic	Practical Day	Topic
1	1st	General features and limitations of electrical machine design	1	Study of design factors and its limitations-for gp-1
	2nd	Types of enclosures		Study of design factors and its limitations-for gp-2
	3rd	Heat dissipation		Study of design factors and its limitations-for gp-3
2	1st	Temperature rise heating and cooling cycles and ratings of machine machines	2	Different approaches in CAD and its flow chart (i) Analysis method (ii) Synthesis method for gp-1
	2nd	Cooling media used.		Different approaches in CAD and its flow chart (i) Analysis method (ii) Synthesis method for gp-2
	3rd	Output equation and output coefficient		Different approaches in CAD and its flow chart (i) Analysis method (ii) Synthesis method for gp-3
3	1st	Specific electric and magnetic loading	3	Core design of transformer for gp-1
	2nd	Effect of size and ventilation		Core design of transformer for gp-2
	3rd	MMF calculation for airgun and iron parts of electrical machines		Core design of transformer for gp-3
4	1st	Gap contraction coefficient.	4	Length of air gap induction machine for gp-1

	2nd	Real and apparent flux densities		Length of air gap induction machine for gp-2
	3rd	Estimation of magnet current of transformers and rotating machines		Length of air gap induction machine for gp-3
5	1st	Load current of transformers and induction motors	5	Calculation for losses of transformer for gp-1
	2nd	Leakage flux reactance calculations for transformers rotating machines,		Calculation for losses of transformer for gp-2
	3rd	Design of field magnet		Calculation for losses of transformer for gp-3
6	1st	Design of transformer	6	Efficiency of transformer for gp-1
	2nd	D.C. machines		Efficiency of transformer for gp-2
	3rd	Induction motor		Efficiency of transformer for gp-3
7	1st	Synchronous machine	7	Main design of Induction motor for gp-1
	2nd	Performance calculations		Main design of Induction motor for gp-2
	3rd	Problems		Main design of Induction motor for gp-3
8	1st	Design on t/f	8	Design of Main dimension of synchronous motor for gp-1
	2nd	Design Problems		Design of Main dimension of synchronous motor for gp-2
	3rd	Specific Electrical and magnetic loading for dc machine		Design of Main dimension of synchronous motor for gp-3
9	1st	Armature design	9	Design of slot dimension of synchronous machine for gp-1
	2nd	Design of field winding		Design of slot dimension of synchronous machine for gp-2
	3rd	Problem on armature and field design		Design of slot dimension of synchronous machine for gp-3

10	1st	Computerization of design Procedures	10	Design the rotor slot for synchronous machine for gp-1
	2nd	Development of Computer program		Design the rotor slot for synchronous machine for gp-2
	3rd	Performance prediction		Design the rotor slot for synchronous machine for gp-3
11	1st	Optimization techniques	11	Length of air gap synchronous machine for gp-1
	2nd	Applications		Length of air gap synchronous machine for gp-2
	3rd	Design Problems		Length of air gap synchronous machine for gp-3

LESSON PLAN

Name of Faculty: Mr. Sandeep Singh

Discipline: Electrical Engineering

Semester: 6th

Subject: Control System Engineering

Lesson Plan Duration: 11 weeks (Jan 2018 to April 2018)

Work Load (Lecture / Practical) per week (in hours) Lectures-03, Tutorial – 01, Pracicals-02

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1st	1st	System/Plant model, types of models, illustrative examples of plants and their inputs and outputs.	1st	Introduction of Lab Equipments and Discussion about Safety measures
	2nd	Controller servomechanism, regulating system, linear time-invariant (LTI) system, time-varying system, causal system	2nd	_____do_____
	3rd	Open loop control system, closed loop control system, illustrative examples of open-loop and feedback control systems, continuous time and sampled data control systems.	3rd	_____do_____
2nd	1st	Effects of feedback on sensitivity (to parameter variations), stability, external disturbance (noise), overall gain etc.	1st	To study speed Torque characteristics of a) A.C. servo motor b) DC servo motor
	2nd	Introductory remarks about non-linear control systems.	2nd	_____do_____
	3rd	Concept of transfer function, relationship between transfer function and impulse response, order of a system	3rd	_____do_____
3rd	1st	Block diagram Algebra	1st	a) To demonstrate simple motor driven closed loop DC position control system.

				(b) To study and demonstrate simple closed loop speed control system.
	2nd	Numerical Problems on Block Diagram Algebra	2nd	_____do_____
	3rd	Test on Block Diagram Algebra	3rd	_____do_____
4th	1st	Characteristic equation, derivation of transfer functions of electrical and electromechanical systems. Numerical Problems	1st	To implement a PID controller for temperature control of a pilot plant.
	2nd	Transfer functions of cascaded and non-loading cascaded elements and Introduction to state variable analysis and design	2nd	_____do_____
	3rd	Typical test signals, time response of first order systems to various standard inputs	3rd	_____do_____
5th	1st	Discussion of Assignment on Time response of 2nd order system to step input, relationship between location of roots of characteristics equation, w and wn, time domain specifications of a general and an under-damped 2nd order system, Numerical Problems	1st	To study behavior of 1 order, 2 order type 0, type 1 system.
	2nd	Steady state error and error constants	2nd	_____do_____
	3rd	Dominant closed loop poles, concept of stability, pole zero configuration and stability.	3rd	_____do_____
6th	1st	Necessary and sufficient conditions for stability Hurwitz stability criterion Routh stability criterion and relative stability, Numerical Problems	1st	To study control action of light control device.
	2nd	Root locus concept, development of root loci for various systems, stability considerations.	2nd	_____do_____
	3rd	Numerical Problems on Root Locus	3rd	_____do_____
7th	1st	Relationship between frequency response and time-response for 2nd order system	1st	Different Toolboxes in MATLAB, Introduction to Control SystemsToolbox.
	2nd	Polar Plots	2nd	_____do_____
	3rd	Numerical Problems on Polar Plots	3rd	_____do_____

8th	1st	Nyquist Criterion	1st	Plot the pole-zero configuration in s-plane for the given transfer function.
	2nd	Numerical Problems on Nyquist Criterion	2nd	_____do_____
	3rd	Bode Plots	3rd	_____do_____
9th	1st	Numerical Problems on Bode Plots	1st	Plot root locus of given transfer function and to find out S, Wd, Wn at given root & to discuss stability.
	2nd	Stability, Gain-margin and Phase Margin, relative stability, frequency response specifications	2nd	_____do_____
	3rd	Necessity of compensation, compensation networks	3rd	_____do_____
10th	1st	Application of lag and lead compensation	1st	Plot the Nyquist plot for given transfer function and to discuss closed loop stability, gain and phase margin.
	2nd	Numerical Problems on Compensation	2nd	_____do_____
	3rd	Basic modes of feedback control, proportional, integral and derivative controllers	3rd	_____do_____
11th	1st	Illustrative Examples on PID	1st	Plot bode plot of given transfer function and find gain and hase margins
	2nd	Discussion of Assignment on Synchros	2nd	_____do_____
	3rd	Class Test	3rd	_____do_____
12th	1st	AC and DC Techo-generators	1st	Practical Problems
	2nd	Stepper Motors &Applications	2nd	_____do_____
	3rd	Magnetic Amplifier	3rd	_____do_____

LESSON PLAN

Name of Faculty : Ms. Ritu Yadav

Discipline : Electrical Engineering

Semester : 6th

Subject : ELECTRICAL POWER GENERATION

Lesson Plan Duration : 11 week (January 2018 to April 2018)

Work load (Lecture/Practical) per week (in hours): Lecture-03, Tutorial-01

Week	Theory		Practical	
	Lecture Day	Topic	Practical Day	Topic
1	1st	INTRODUCTION Energy sources	1	NA
	2nd	Availability		NA
	3rd	Recent trends in Power Generation		NA
2	1st	Interconnected Generation of Power Plants	2	NA
	2nd	POWER GENERATION PLANNING Load forecasting		NA
	3rd	Load curves		NA
3	1st	Load duration curve	3	NA
	2nd	Base load and Peak load Power Plants		NA
	3rd	Connected Load		NA
4	1st	Maximum demand	4	
	2nd	Demand factor		
	3rd	Group diversity factor		
5	1st	Load factor	5	NA
	2nd	Significance of load factor		NA
	3rd	Plant factor		NA
6	1st	Capacity factor	6	NA
	2nd	Selection of unit size, No. of Units		NA

	3rd	Reserves, cost of power generation		NA
7	1st	Depreciation, tariff	7	NA
	2nd	Selection of site		NA
	3rd	Capacity calculations		NA
8	1st	Classification, Schematic diagram and working of Thermal Power Stations	8	NA
	2nd	Hydro Electric Plant		NA
	3rd	Nuclear Power Plant		NA
9	1st	Diesel Power Stations	9	NA
	2nd	NON-CONVENTIONAL ENERGY SOURCES		NA
	3rd	Wind, Solar, Tidal, Ocean		NA
10	1st	Geothermal sources of Energy	10	NA
	2nd	Fuel cell		NA
	3rd	Magneto Hydro Dynamic (MHD) system		NA
11	1st	Energy management	11	NA
	2nd	Energy Audit		NA
	3rd	Energy Efficient Motors, Co-generation		NA

Lesson Plan

Name of Faculty : Mr. Amit Kaushik

Discipline : Electrical Engineering

Semester : 6thSem

Subject : Power System - II

Lesson Plan Duration : 11 week (January 2018 to April 2018)

Work load (Lecture/Practical) per week (in hours): Lecture-03, Tutorial-01, Lab - 02

Week	Theory	
	Lect. Day	**Topic(Including assignment/test)**
1	1	Introduction to faults and fault analysis in power system.
	2	Transients on a transmission line. Transient analysis on a transmission line.
	3	Short circuit analysis of synchronous machine at no load and on full load.
2	1	Symmetrical component of power system.
	2	Symmetrical component transformation. Phase shift in star-delta transformation.
	3	Sequence impedances.
3	1	Single line to ground fault, Line to line fault.
	2	Double line to ground fault, Open conductor fault.
	3	Circuit breakers, circuit breaker ratings
4	1	Theory of arc interruption, Re-striking voltage transients
	2	Current chopping,
	3	Automatic switch, duties of switch gear.
5	1	Air circuit breaker, air blast,
	2	Bulk oil, minimum oil,
	3	SF6 CB, vacuum and DC circuit breakers.
6	1	Protection of Transformer,
	2	Protection of generator
	3	Protection of motor and bus zone.
7	1	Protective Relays: zone of protection, Essential qualities,
	2	Primary and backup protections,
	3	Relay classification, Principal types of electromagnetic relays, attracted armature, induction disc, induction cup types.
8	1	Over -current, instantaneous over current relay.

	2	IDMT, directional and differential relays,
	3	Distance relays, plain impedance,
9	1	MHO, Reactance, Offset MHO type,
	2	Transmission line & feeder protection
	3	Pilot wire and carrier current protection, neutral grounding.
10	1	Classification of static relays, amplitude and phase comparators,
	2	Block-spike and block-average comparators,
	3	Rectifier type relays.
11	1	Introduction to digital relay: basic principles. Travelling wave relay,
	2	Application of microprocessors and computers - recent Trends.
	3	Relaying schemes based on microwave and optical fiber link.

Practical	
Practical day	EXPERIMENT
1	To draw the operating characteristics of IDMT relay.
2	To study the performance of Earth fault relay.
3	To study the performance of a over voltage relay.
4	To study the performance of under voltage relay.
5	Testing of breakdown strength of transformer oil.
6	To study flash point test of transformer oil.
7	To find ABCD ,Hybrid & Image parameters of a model of transmission line
8	To study performance of a transmission line under no load condition & under load at different power factors.
9	To study performance characteristics of typical DC distribution system in radial & ring main configuration
10	To study radial feeder performance when a) fed at one end b) fed at both ends.

LESSON PLAN

Name of Faculty: SAWAN

Discipline: Electronics & Communication Engineering

Semester: 6th

Subject: Microcontroller and Embedded Systems (ECE+EE)

Lesson Plan Duration: 15 weeks (Jan 2018 to April 2018)

Work Load (Lecture / Practical) per week (in hours) Lectures-03, Pracicals-06

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1st	1st	Difference between microprocessors and microcontrollers and different types of microcontrollers	1st	Write an Assembly language Programme (ALP) to generate 10 kHz square wave.
	2nd	Embedded microcontrollers, External memory microcontrollers	2nd	-------do------
	3rd	Processor Architectures Harvard V/S Princeton	3rd	-------do------
2nd	1st	CISC V/S RISC	1st	To study implementation & interfacing of Display devices Like LCD, LED Bar graph & seven segment display with Microcontroller 8051/AT89C51
	2nd	Microcontrollersfeatures : clocking	2nd	-------do------
	3rd	i/o pins, interrupts	3rd	-------do------
3rd	1st	Continue..	1st	Revision
	2nd	Discussion on Assignment.	2nd	-------do------
	3rd	Class Test	3rd	-------do------
4th	1st	Microcontroller 8051- Architecture	1st	Write an ALP for temperature & pressure measurement.
	2nd	Pin Diagram of 8051	2nd	-------do------
	3rd	I/O Ports of 8051	3rd	-------do------

5th	1st	InternalRAM and Registers, Memory Organization and external addressing	1st	Write a program to interface a graphical LCD with 89C51.
	2nd	Interrupts, Addressing Modes of 8051	2nd	-------do------
	3rd	Instruction Set of 8051	3rd	-------do------
6th	1st	Instruction Set of 8051 cntd..	1st	Revision 1
	2nd	Assembly Language Programming Examples	2nd	-------do------
	3rd	Assembly Language Programming Examples cntd..	3rd	-------do------
7th	1st	Interfacing of LCD with 8051	1st	To study Programming and Transmission & reception of data through Serial port & study of Parallel printer port.
	2nd	Interfacing of ADC & DAC with 8051	2nd	-------do------
	3rd	Interfacing of stepper motor with 8051	3rd	-------do------
8th	1st	Interfacing of Key board and sensors with 8051.	1st	Repeat previous
	2nd	Discussion on Assignment	2nd	-------do------
	3rd	Introduction to PIC microcontrollers,	3rd	-------do------
9th	1st	Architecture and pipelining in PIC	1st	To interface PWM based voltage regulator using PIC Microcontroller
	2nd	Architecture and pipelining in PIC cntd..	2nd	-------do------
	3rd	program memory considerations in PIC	3rd	-------do------
10th	1st	Addressing modes, CPU registers in PIC	1st	Repeat previous
	2nd	Instruction set of PIC	2nd	-------do------
	3rd	Simple operations using PIC Instructions	3rd	-------do------
11th	1st	Simple operations using PIC Instructions	1st	Revision 2
	2nd	Class Test	2nd	Revision 2
	3rd	Embedded Systems-Introduction	3rd	Revision 2
12th	1st	Detailed classification of embedded systems.	1st	Study and analysis of interfacing of Graphical LCD using PIC controller

	2nd	Different type of processors used in embedded systems	2nd	-------do-----
	3rd	Hardware Units, SoftwareEmbedded into System,	3rd	-------do-----
13th	1st	Applications and Products of Embedded Systems	1st	Study and interfacing of IR (RC5 protocol) and RF Communication using PIC controller
	2nd	Structural Units inProcessor,	2nd	-------do-----
	3rd	Memory Devices, I/O Devices	3rd	-------do-----
14th	1st	Different types of Buses	1st	Study of SD/MMC card Interface using 18F4550
	2nd	Interfacing of Processor Memory and I/O Devices,	2nd	-------do-----
	3rd	Interfacing of Processor Memory and I/O Devicescntd..	3rd	-------do-----
15th	1st	Case Study of an Embedded System for a Smart Card.	1st	Revision 2
	2nd	Class Test	2nd	Revision 2
	3rd	Programming Problems	3rd	Revision 2

Name of Faculty : NEHA GUPTA

Discipline : **ECE**

Semester : **6th Sem**

Subject : **Digital System Design, Digital System Design Lab**

Lesson Plan Duration : **15 weeks (From Jan 2018 to April, 2018)**

Work Load (Lecture / Practical) per week (in hours) Lectures-03, Pracicals-06

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1st	1st	Introduction to Computer-aided design tools for digital systems, Hardware description languages	1st	Familiar With EDA tool
	2nd	Introduction to VHDL data objects	2nd	……Do…….
	3rd	Classes and data type	3rd	……Do…….
2nd	1st	Classes and data type (Continues…)	1st	Design all gates using VHDL.
	2nd	Operators, Overloading	2nd	……Do…….
	3rd	Logical operators, Types of delays	3rd	……Do…….
3rd	1st	Entity and Architecture declaration	1st	Problem with experiments
	2nd	Class Test	2nd	……Do…….
	3rd	Assignment statements, sequential statements and process	3rd	……Do…….
4th	1st	Conditional statements, case statement, Array	1st	Write VHDL programs for the following circuits, check the wave forms and the hardware generated a. half adder b. full adder
	2nd	Loops, resolution functions	2nd	……Do…….
	3rd	Packages and Libraries	3rd	……Do…….

5th	1st	Concurrent statements. Subprograms	1st	Write VHDL programs for the following circuits, check the wave forms and the hardware generated a. multiplexer b. demultiplexer
	2nd	Application of Functions and Procedures	2nd	……Do……..
	3rd	Structural Modeling, component declaration	3rd	……Do……
6th	1st	Structural layout and generics	1st	Write VHDL programs for the following circuits, check the wave forms and the hardware generated a. decoder b. encoder
	2nd	Discussion - Coding based Problem	2nd	……Do……
	3rd	Discussion - Coding based Problem	3rd	……Do……
7th	1st	Multiplexers, Demultiplexers	1st	Write a VHDL program for a comparator and check the wave forms and the hardware generated
	2nd	Model of encoders, decoders	2nd	……Do……
	3rd	Coding based Problem	3rd	……Do……
8th	1st	Coding based Problem	1st	Write a VHDL program for a code converter and check the wave forms and the hardware generated
	2nd	Model of code converters	2nd	……Do…….
	3rd	Coding based Problem	3rd	……Do…….
9th	1st	Model of Comparators, implementation of Boolean functions etc.	1st	Write a VHDL program for a FLIP-FLOP and check the wave forms and the hardware generated
	2nd	Coding based Problem	2nd	……Do…….

	3rd	Model of Shift Registers	3rd	……Do…….
10th	1st	Coding based Problem	1st	Write a VHDL program for a counter and check the wave forms and the hardware generated
	2nd	Model of Counters	2nd	……Do……..
	3rd	Coding based Problem	3rd	……Do……..
11th	1st	Model of Counters	1st	Write VHDL programs for the following circuits, check the wave forms and the hardware generated a. register
	2nd	Coding based Problem	2nd	……Do…… ……..
	3rd	Assignment --- Designing of a simple microcomputer system using VHDL , FPGA and CPLD	3rd	……Do…… ……..
12th	1st	Basic components of a computer, specifications	1st	Problem with experiments
	2nd	Architecture of a simple microcomputer system	2nd	……Do…….
	3rd	Implementation of a simple microcomputer system using VHDL	3rd	……Do…….
13th	1st	Introduction of Programmable logic device	1st	Write VHDL programs for the following circuits, check the wave forms and the hardware generated b. Shift register
	2nd	ROM , PLAs	2nd	……Do…….
	3rd	PAL ,GAL and PEEL	3rd	……Do…….
14th	1st	Designing Problem with ROM,PLA,PLA	1st	Design a 3: 8 decoder
	2nd	Designing Problem with ROM,PLA,PLA	2nd	……Do…….

	3rd	CPLDs and FPGA	3rd	……Do…….
15th	1st	Design implementation using CPLDs and FPGAs	1st	Internal Vice Voce
	2nd	Design implementation using CPLDs and FPGAs (Continues…)	2nd	Internal Vice Voce
	3rd	Class Test	3rd	Internal Vice Voce