Govt. Polytechnic, Nanakpur (Panchkula)
Electrical Engineering Department
Lesson plan (for odd-semester as per revised curriculum and study scheme)

Name of Faculty	**Mr. Neeraj Kamboj**
Discipline	**Electrical Engineering**
Semester	**3rd (odd- semester)**
Subject	**Non- Conventional Energy Sources**
Lesson Plan Duration	**15 WEEKS**
Work load (Theory + Practical) Per Week	**(04+00)**

Week	Day	Topics
1st	1	Discussion of Course Objective of NCES subject/ Syllabus
	2	Unit :1 Introduction to Basics of Energy
	3	Classification of Energy-primary and secondary energy
	4	commercial and non-commercial energy
2nd	1	Unit :1 Importance of non-conventional energy sources
	2	Present scenario, Future Prospectus
	3	Energy Scenario in India, Sector-wise energy consumption (domestic, industrial, agriculture etc)
	4	Revision and problem related to 1st unit/ discussion related to topic
3rd	1	Unit : 2 Introduction to Solar Energy
	2	Principle of conversion of solar radiation into heat, photo-voltaic cell
	3	Electricity generation
	4	Application of Solar Energy like solar water heaters
4th	1	Unit: 2 Solar Furnaces
	2	Solar Cookers
	3	Solar lighting, Solar pumping
	4	Class Test of 1st unit
5th	1	Unit: 3 Bio- energy
	2	Bio-mass conversion technologies-wet and dry processes
	3	Revision and problem related to 2nd Unit/ discussion related to topic
	4	Quiz Test
6th	1	Unit: 3 Methods for obtaining energy from biomass
	2	Power generation by using gasifiers
	3	Revision and problem related to 3rd unit
	4	Class Test of 2nd unit
7th	1	Unit : 4 Introduction to Wind energy
	2	Wind Energy Conversion
	3	Windmills
	4	Electricity generation from wind- Types of wind mills
8th	1	Unit: 4 Local Control
	2	Energy storage
	3	Revision and problem related to 4th Unit/ discussion related to topic
	4	Class Test of 3rd unit, Conduct of 1st Sessional test (tentative)
9th	1	Display of 1st sessional marks and identification of weak students.
	2	Unit: 5 Introduction to Geo-thermal and Tidal Energy, Geo-thermal sources
	3	Ocean thermal electric conversion

	4	Open and Closed cycles
10th	1	Unit : 5 Hybrid cycles
	2	Prime movers for geo-thermal energy conversion
	3	Steam Generation and electricity generation
	4	Revision and problem related to 5th unit/ discussion related to topic
11th	1	Unit :- 6 Introduction to MHD
	2	Magneto hydro Dynamic (MHD)
	3	Revision and problem related to 5thunit
	4	Class Test of 5th unit
12th	1	Unit : 7 Fuel Cells
	2	Design and operating Principles of a fuel cell
	3	Conversion Efficiency
	4	Revision and problem related to 6thunit, Conduct of 2nd Sessional test (tentative)
13th	1	Display of 2nd sessional marks and identification of weak students.
	2	Unit : 7 Work output and e.m.f of fuel cells, Applications
	3	Revision and problem related to 6thunit
	4	Class Test of 6th unit
14th	1	Unit : 8 Hydro Energy
	2	Mini & micro hydro plants
	3	Revision and problem related to 7th unit/ discussion related to topic
	4	Class Test of 7th unit
15th	1	Revision and problem related to 8th unit
	2	Discussion of old question paper of HSBTE.
	3	Conduct of 3rd Sessional test (tentative)
	4	Display of 3rd Sessional marks
16th	1	Identification of weak students
	2	Viva-voice related to subject
	3	Revision/Review/Test of old HSBTE Papers
	4	Revision/Review/Test of old HSBTE Papers

Govt. Polytechnic Nanakpur(Panchkula) Haryana
Electrical Engineering Department
Lesson Plan

Name of the Faculty	Sh. Neeraj Kamboj
Discipline	Electrical engineering
Semester	3rd
Subject	Computer Applications in Electrical Installation
Lesson Plan Duration	**15 WEEKS**
Workload (Theory/Practical) per week/3hours	(Theory 00 / Practical 02), Day (Group1+group2)

Week	Day	Practical
1	1	**Unit -1 Introduction MATLAB and SCILAB**
	2	**MATLAB Programming – input/output**
2	1	**Types of graphs, functions,**
	2	
3	1	**Loops, structures**
	2	
4	1	**MATLAB Simulink.**
	2	
5	1	**Programming and simulation examples and solution**
	2	
6	1	**Assignment /Revision/File check**
	2	
7	1	**Mid-term viva-voice evaluation**
	2	
8	1	**Unit -2: Introduction to LABVIEW**
	2	
9	1	**Graphical Programming using LabVIEW including creation of VIs, sub VIs**
	2	
10	1	**structures, arrays, clusters, charts and graphs, strings, File I/Os**
	2	
11	1	**Practice on NI ELVIS and other DAQ hardware**
	2	
12	1	**Assignment /Revision/ File check**
	2	
13	1	**Mid-term viva-voice evaluation**
	2	
14	1	**Unit3: Utility of EPLAN software**
	2	
15	1	**Assignment /Revision/ File check**
	2	
16	1	**Internal Practical**
	2	

Govt. Polytechnic, Nanakpur(Panchkula)
Electrical Engineering Department
Lesson Plan (for odd semester)

Name of Faculty					
Discipline			Electrical Engineering		
Semester			3rd		
Subject			Electronics-II		
Lesson Plan Duration			**15 WEEKS**		
Workload (Theory + Practical) Per Week			[03 + 02] Group 1 & 2		
Week	Day	Theory Topic/ Assignment/ Test		No.	Practical
1st	1	Unit:1 Transistor Audio Power Amplifier		1	To study the effect of coupling capacitor on lower cut off frequency and upper cut off frequency by plotting frequency response curve of a two stage RC coupled amplifier
	2	Difference between voltage and power amplifier			
	3	Terms in Power Amplifier, collector efficiency, distortion and dissipation capability			
2nd	1	Classification of power amplifier class A, B and C		2	
	2	Class A single-ended power amplifier, its working and collector efficiency Impedance matching in a power amplifier using transformer			To measure (a) optimum load (b) output power (c) signal handling capacity of a push-pull amplifier
	3	Heat sinks in power amplifiers, Push-pull amplifier: circuit details working and advantages			
3rd	1	Principles of the working of complementary symmetry push-pull amplifier		3	To measure (a) voltage gain (b) input and output impedance for an emitter follower circuit
	2	Revision/Assignment of 1st unit			
	3	Class test of 1st unit			
4th	1	Unit-2 Introduction to tuned voltage amplifier		4	Practical Quiz No.2/ Revision and file checking
	2	Series and parallel resonance, Single and double tuned voltage amplifiers			
	3	Frequency response of tuned voltage amplifiers, Applications of tuned voltage amplifiers			
5th	1	Revision/Assignment of 2nd unit		5	To measure frequency generation in (a) Hartley (b) R-C Phase Shift oscillator
	2	Class test of 2nd unit			
	3	Unit3: Feedback in Amplifiers positive and negative feedback and their need			
6th	1	Voltage gain of an amplifier with negative feedback A = A/1+βA		6	Practical Quiz No.3/ Revision and file checking
	2	Effect of negative feedback on voltage gain, stability, distortion, band width			
	3	Output and input impedance of an amplifier			

7th	1	Typical feedback circuits	7	To observe the differentiated and integrated square wave on a CRO for different values of R-C time constant	
	2	Effect of removing the emitter by-pass capacitor on a CE transistor amplifier			
	3	Emitter follower and its applications			
8th	1	Revision/Assignment of 3rd unit		Clipping of both portion of sine-	
	2	Unit4: Sinusoidal oscillators amplifier positive			

		feedback	8	wave using: diode and dc source/ Zener diodes	
	3	Difference between an oscillator and an alternator			
9th	1	Essentials of an oscillator, Circuit details and working of LC oscillators	9	Clamping a sine-wave to: Negative dc voltage Positive dc voltage	
	2	Tuned Collector, Hartley			
	3	and Colpitt's oscillators, R-C oscillator circuits			
10th	1	phase shift and Wein bridge oscillator circuits	10	Practical Quiz No.3/ Revision and file checking	
	2	Introduction to piezoelectric crystal and crystal oscillator circuit			
	3	Revision/Assignment of 4th unit			
11th	1	Wave-Shaping and Switching Circuits	11	To generate square-wave using an astable multivibrator and to observe the wave form on a CRO	
	2	Concept of Wave-shaping circuits			
	3	R-C differentiating and integrating circuits			
12th	1	Diode clipping circuits, Diode clamping circuits	12	To observe triggering and working of a bistable multivibrator circuit and observe its output wave form on a CRO	
	2	Applications of wave-shaping circuits, Transistor as a switch			
	3	Collector coupled astable, monostable, Bistable multivibrator circuits			
13th	1	Working and applications of transistor inverter circuit using power transistors	13	Practical Quiz No.3/ Revision and file checking	
	2	Revision/Assignment of 5th unit			
	3	Unit6: Working Principles of different types of power supplies viz. CVTs			
14	1	IC voltage regulators(78xx,79xx)	14	Op-Amp (IC 741) as inverting and non-inverting amplifier, adder Comparator, integrator and differ -entiator verify using p-spice	
	2	Revision/Assignment of 6th unit			
	3	Unit7: Operational Amplifier, differential amplifier			
15th	1	Emitter coupled differential amplifier Offset even voltages and currents	15	To study the pin configuration and working of IC 555 and its use as mono stable and astable multi vibrator	
	2	Integrator and differentiator, Summer, Subtractor			
	3	Familiarization with specifications and pin configuration of IC 741			
16th	1	Block diagram and operation of 555 IC timer	16	Internal Practical/viva-voice evaluation	
	2	HSBTE old paper solution			

Name of Faculty	
Discipline	Electrical Engineering
Semester	3rd (odd- semester)
Subject	Electrical and Electronics Engineering Materials
Lesson Plan Duration	15 WEEKS
Work load (Theory + Practical) Per Week	(04+00)

Week	Day	Topics
1st	1	Introduction to Classification of materials
	2	Classification of Conducting ,semi conducting and insulating materials based on atomic structure
	3	Classification based on energy bands
	4	Revision and Class test of 1st unit
2nd	1	Introduction to Conducting Materials Resistance and factors affecting it Such as alloying and temperature
	2	Classification of conducting material as low resistivity and high resistivity materials
	3	low resistance materials Copper: General properties as conductor resistivity, temperature coefficient and density
	4	Mechanical properties of hard-drawn and annealed copper corrosion, contact resistance
3rd	1	Application of copper in the field of electrical engineering.
	2	Aluminium: General properties as resistivity, temperature coefficient, density
	3	Mechanical properties of hard and annealed aluminium, solder ability, contact resistance
	4	Applications in the field of electrical engineering.
4th	1	Steel: Mechanical properties of steel
	2	Applications in the field of electrical engineering.
	3	Introduction to bundle conductors and its applications
	4	Low resistivity copper alloys Brass, Bronze and their applications
5th	1	Applications of special metals e.g. Silver, Gold, Platinum etc
	2	High resistivity materials and their applications manganin, constantan,
	3	Nichrome, mercury, platinum, carbon and tungsten
	4	Superconductors and their applications
6th	1	Revision and problem related to 2nd unit
	2	Class Test of 2nd unit
	3	Review of Semi-conducting Materials, Semi-conductors and their properties
	4	Materials used for electronic components like resistors, capacitors, diodes, transistors and inductors etc
7th	1	Revision and problem related to 3rd unit
	2	Class Test of 3rd unit
	3	Insulating materials; General Properties
	4	Electrical Properties :Resistivity, surface resistance, dielectric loss, dielectric strength
8th	1	Physical Properties Hygroscopicity, tensile and compressive strength, abrasive resistance, brittleness
	2	Thermal Properties: Heat resistance, classification according to permissible temperature rise

	3	Chemical Properties: Solubility, chemical resistance, weather ability
	4	Mechanical properties, mechanical structure, tensile structure
9th	1	Revision and problem related to 4th unit,Ist Sessional Test
	2	Class Test of 4th unit
	3	Introduction to Insulating Materials and their applications
	4	Plastics Definition and classification
10th	1	Thermosetting materials: Bakelite, amino resins, epoxy resins their important properties and applications
	2	Thermo-plastic materials: PVC, Polyethelene, silicones, their important properties and applications
	3	Natural insulating materials, properties and their applications
	4	Mica and Mica products, Asbestos and asbestos products, Ceramic materials
11th	1	Glass and glass products Cotton, silk, jute, paper, Rubber, Bitumen
	2	Mineral and insulating oil for transformer, insulating varnish for coating and impregnation
	3	Gaseous materials; Air, Hydrogen, Nitrogen, SF their properties and applications
	4	Revision and problem related to 5th unit
12th	1	Class Test of 5th unit
	2	Magnetic Materials: Introduction, Ferromagnetic materials, permeability
	3	B-H curve, magnetic saturation, hysteresis loop including coercive force and residual magnetism
	4	Concept of eddy current and hysteresis loss, Curie temperature, magnetostriction effect.
13th	1	Soft Magnetic Materials: Alloyed steels with silicon: High silicon alloy steel for transformers
	2	low silicon alloy steel for electric rotating machines
	3	Cold rolled grain oriented steels for transformer, Non-oriented steels for rotating machine, Nickel-iron alloys, Soft Ferrites
	4	Hard magnetic materials Tungsten steel, chrome steel , hard ferrites cobalt and Steel applications.2nd Sessional test.
14th	1	Revision and problem related to 6th unit
	2	Class Test of 6th unit
	3	Special Materials Thermocouple, bimetals
	4	leads soldering and fuses material and their applications
15th	1	Revision and problem related to 7th unit
	2	Introduction of various engineering materials necessary for fabrication of electrical machines
	3	such as motors, generators, transformers etc.
	4	Revision and problem related to 8th unit,Final sessional Test
16th	1	Class Test of 8th unit
	2	Viva-voice related to subject
	3	Revision/Review/Test of old HSBTE Papers
	4	Revision/Review/Test of old HSBTE Papers

Govt. Polytechnic Nanakpur(Panchkula) Haryana
Electrical Engineering Department
Lesson Plan

Name of the Faculty	Neeraj Kumar
Discipline	Electrical Engineering
Semester	3rd
Subject	EEDD-I
Lesson Plan Duration	**15 WEEKS**
Work Load (Theory/Practical) per week /3hours	(Theory 00 / Practical 06) (Group1+group2)

Week	Day	Practical
1st	1	Unit 1 : Introduction Symbols and Signs Conventions
	2	Drawing sheet1: Various Electrical Symbols used in Domestic and Industrial Installation and Power System
2nd	1	Unit2: Wiring diagram introduction , Drawing sheet2 :Wiring Diagram of light
	2	Drawing sheet: Wiring Diagram of fan
3rd	1	Drawing sheet: Wiring Diagram bell and alarm circuits
	2	Drawing sheet: Wiring Diagram Staircase
4th	1	Drawing sheet: Wiring Diagram go down wiring
	2	Checking and correction in Drawing sheet
5th	1	Unit 3: Introduction Panels/Distribution Boards
	2	Two Drawing sheet : panels/Distribution board using MCB and ElCB and change over switches for domestic installation
6th	1	Drawing sheet: industrial and commercial installation
	2	Checking and correction in Drawing sheet
7th	1	Unit4: Introduction to orthographic projections of Simple Electrical Parts
	2	Drawing sheet of Bus bar post/ Kit Kat
8th	1	Drawing sheet of Pin type and shackle type insulator (Pin Type 11kV/66kV)
	2	Checking and correction in Drawing sheet ,Ist Sessional Test
9th	1	Drawing sheet of Bobbins of a small transformer / choke
	2	Drawing sheet of Stay insulators/Suspension type insulators
10th	1	Checking and correction in Drawing sheet
	2	Drawing sheet of Rotor of a squirrel cage induction motor
11th	1	Drawing sheet of Motor body (induction motor) as per IS Specifications (using outside dimensions)
	2	Checking and correction in Drawing sheet
12th	1	Drawing sheet of Slip rings of 3-phase induction Motor

	2	Drawing sheet of Stator of 3 phase Induction motor (Sectional View) ,Second Sessional test
13th	1	Checking and correction in Drawing sheet
	2	Unit 5: Introduction to AutoCAD Drawing sheet1 Prepare wiring diagram and block diagrams for circuits/systems using any Engineering Graphic package (preferably CAD)
14th	1	Checking and correction in Drawing sheet
	2	Checking and correction in Drawing sheet
15th	1	Revision/checking
	2	Revision/checking ,3rd Sessional test
16th	1	Quiz/Checking and correction in Drawing sheet
	2	Viva-voice and Internal Practical

Lesson Plan

Name of the Faculty:	Neeraj Kumar
Discipline:	Electrical engg.
Semester:	3rd
Subject:	Estimating & Costing in Electrical Engg.(**Theory-4 Practical-2)**
Lesson Plan Duration: 15 weeks	

Week	Theory	
	Lecture day	**Topic(including assignment/test)**
1st	**1st**	☐ Will Discuss Learning outcomes of Estimating & Costing in Electrical Engg.
		☐ Introduction to complete syllabus of Estimating & Costing in Electrical Engg.
	2nd	**Unit-1: Purpose of estimating and costing,**
		☐ Proforma for making estimates,
		☐ Preparation of materials schedule
	3rd	☐ Costing, price list,
		☐ Preparation of tender document
	4th	☐ Net price list,
		☐ Market survey,
2nd	**1st**	☐ Overhead charges,
		☐ Labour charges,
	2nd	☐ Electrical point method and fixed percentage method,
		☐ contingency,
	3rd	☐ Profit,
		☐ purchase system,
	4th	☐ Enquiries,
		☐ Eomparative statements
3rd	**1st**	☐ Payment of bills.
		☐ Orders for supply
	2nd	☐ Tenders – its constituents, finalization,
		☐ Specimen tender.
	3rd	**Unit-2: Types of wiring:**

	4th	☐ Cleat, batten, wiring,
		☐ casing capping and
		☐ conduit wiring,
4th	1st	☐ Comparison of different wiring systems.
	2nd	☐ Design of wiring schemes for particular situation of domestic installation.
	3rd	☐ Design of wiring schemes for particular situation Industrial Installation.

	4th	☐ Selection of wires and cables,
5th	1st	☐ Wiring accessories used for Electrical Installation
	2nd	☐ Use of protective devices i.e. MCB, ELCB etc.
	3rd	☐ Use of wire-gauge and tables (to be prepared/arranged)
	4th	☐ Revision/ queries of unit-1,2 ;
		☐ First assignment will be given
6th	1st	☐ Assignment –I check
		☐ Tentative 1st sessional test
		☐ Evaluation of sessional marks etc.
	2nd	☐ Assignment –I check
		☐ Tentative 1st sessional test
		☐ Evaluation of sessional marks etc.
	3rd	☐ Display and analysis of sessional marks
	4th	**Unit-3 Estimating &costing:** **3.1 Domestic installations;** ☐ description of various tests to test the wiring installation before commissioning,
7th	1st	☐ Standard practice as per IS and IE rules.
		☐ Planning of circuits, sub circuits.
	2nd	☐ Position of different accessories,
		☐ Electrical layout of Domestic Installation

	3rd	☐ Preparing estimates including cost as per schedule rate pattern and actual market rate (for house of two room set along with layout sketch)
	4th	**3.2 Industrial installations;** ☐ Relevant IE rules and IS standard practices,
8th	1st	☐ Planning of installation for single phase motors of different rating. ☐ designing for single phase motors of different ratings
	2nd	☐ Estimation of installation for single phase motors of different ratings, ☐ Electrical circuit diagram for Industrial installations ,
	3rd	☐ Starters for Industrial installations. ☐ Preparation of list of materials for Industrial installations,
	4th	☐ Estimating and costing exercises on workshop with singe-phase motor load,Ist sessional test

9th	1st	☐ Estimating and costing exercises on workshop with 3-phase motor load and the light load (3-phase supply system)
	2nd	**3.3** Service line connections estimate for domestic upto 10 KW from pole to energy meter.
	3rd	☐ Service line connections estimate for Industrial loads upto 20 KW over-head connection from pole to energy meter.
	4th	☐ Service line connections estimate for Industrial loads upto 20 KW underground connections from pole to energy meter. ☐ Second assignment will be given
10th	1st	☐ Revision/ queries of unit-3
	2nd	☐ Assignment –II check ☐ Tentative 2nd sessional test ☐ Evaluation of sessional marks etc.
	3rd	☐ Assignment –II check

		☐ Tentative 2ⁿᵈ sessional test
		☐ Evaluation of sessional marks etc.
	4th	☐ Display and analysis of sessional marks
11th	1st	**Unit-4 :-Estimating the material required 4(a):** ☐ Transmission and distribution lines overhead planning and designing of lines with different fixtures based on unit cost calculations
	2nd	☐ Transmission and distribution lines overhead planning and designing of earthing etc.
	3rd	☐ Transmission and distribution lines underground planning and designing of lines with different fixtures, based on unit cost calculations
	4th	☐ Transmission and distribution lines underground planning and designing of lines with earthing etc.
12th	1st	**4(b) Substation:** ☐ Types of substations, ☐ substation schemes and components
	2nd	☐ Estimate of 11/0.4 KV pole mounted substation up to 200 KVA rating,
	3rd	☐ Methods of earthing of substations, ☐ Key Diagram of 66 KV/11KV
	4th	☐ Key Diagram of 11 KV/0.4 KV Substation **Second Sessional Test**

13th	1st	☐ Single line diagram, layout sketching of outdoor, indoor 11kV sub-station
	2nd	**Unit 5 Preparation of Tender Documents**
	3rd	At least 2-3 exercises, tender – constituents finalization
	4th	At least 2-3 exercises, specimen tender
14th	1st	☐ 3ʳᵈ assignment will be given

		☐ Revision/ queries of unit-4
	2nd	☐ Assignment –III check
		☐ Tentative 3rd sessional test
		☐ Evaluation of sessional marks etc.
	3rd	☐ Assignment –III check
		☐ Tentative 3rd sessional test
		☐ Evaluation of sessional marks etc
	4th	☐ Display/analysis of 3rd sessional test
15th	**1st**	☐ Remedial will be taken if any shortcomings found
		☐ Previous state boards question will be carried out, any other left out topic
	2nd	☐ Seminal/group discussion as per evaluation scheme
	3rd	☐ Seminal/group discussion as per evaluation scheme
	4th	☐ Seminal/group discussion as per evaluation scheme, **Final Sessional test**