

**B.K.N. Govt. Polytechnic Narnaul Haryana****Electrical Engineering Department****Lesson Plan**

<b>Name of Faculty</b>	<b>Sh. Jagdeep</b>
<b>Discipline</b>	<b>Electrical Engineering</b>
<b>Semester</b>	<b>6<sup>th</sup></b>
<b>Subject</b>	<b>Entrepreneurship Development and Management</b>
<b>Lesson Plan Duration</b>	<b>From 6 March 2023 to 23 June 2023</b>
<b>Work load [Theory] Per Week</b>	<b>[03]</b>

<b>Week</b>	<b>Theory</b>	
	<b>Lecture Day</b>	<b>Topic</b>
<b>1<sup>st</sup></b>	<b>1<sup>st</sup></b>	ENTREPRENEURSHIP - Introduction
	<b>2<sup>nd</sup></b>	Concept /Meaning and need of Entrepreneurship
	<b>3<sup>rd</sup></b>	Qualities and functions of entrepreneur and barriers in entrepreneurship
<b>2<sup>nd</sup></b>	<b>1<sup>st</sup></b>	Sole proprietorship and partnership forms of business organisations
	<b>2<sup>nd</sup></b>	• Considerations in product selection Schemes of assistance by entrepreneurial support agencies at National, State, District level: NSIC, NRDC, DC:MSME, SIDBI, NABARD, Commercial Banks, SFC's TCO, KVIB, DIC, Technology Business Incubator (TBI) and Science and Technology Entrepreneur Parks (STEP).
	<b>3<sup>rd</sup></b>	Market Survey and Opportunity Identification
<b>3<sup>rd</sup></b>	<b>1<sup>st</sup></b>	Seminar/Case Study /Expert Lecture/Revision
	<b>2<sup>nd</sup></b>	Scanning of business environment
	<b>3<sup>rd</sup></b>	Salient features of National and State industrial policies and resultant business opportunities
	<b>1<sup>st</sup></b>	Types and conduct of market survey
	<b>2<sup>nd</sup></b>	Assessment of demand and supply in potential areas of growth

4 <sup>th</sup>	3 <sup>rd</sup>	. Identifying business opportunity
5 <sup>th</sup>	1 <sup>st</sup>	Considerations in product selection
	2 <sup>nd</sup>	Project report Preparation Preliminary project report
	3 <sup>rd</sup>	Detailed project report including technical, economic and market feasibility
6 <sup>th</sup>	1 <sup>st</sup>	Common errors in project report preparations
	2 <sup>nd</sup>	Exercises on preparation of project report
	3 <sup>rd</sup>	Introduction to Management
7 <sup>th</sup>	1 <sup>st</sup>	Definitions and importance of management
	2 <sup>nd</sup>	Functions of management: Importance and Process of planning, organising, staffing, directing and controlling
	3 <sup>rd</sup>	Principles of management (Henri Fayol, F.W. Taylor)
8 <sup>th</sup>	1 <sup>st</sup>	Concept and structure of an organisation
	2 <sup>nd</sup>	Types of industrial organisations a) Line organisation b) Line and staff organisation c) Functional organisation
	3 <sup>rd</sup>	Seminar/Case Study /Expert Lecture/Revision
9 <sup>th</sup>	1 <sup>st</sup>	Leadership and Motivation a) Leadership Definition and Need Qualities and functions of a leader
	2 <sup>nd</sup>	Manager Vs leader Types of leadership
	3 <sup>rd</sup>	b) Motivation Definitions and characteristics
	1 <sup>st</sup>	Factors affecting motivation Theories of motivation (Maslow, Herzberg, McGregor)

<b>10<sup>th</sup></b>	<b>2<sup>nd</sup></b>	Management Scope in Different Areas a) Human Resource Management Introduction and objective Introduction to Man power planning, recruitment and selection
	<b>3<sup>rd</sup></b>	Seminar/Case Study /Expert Lecture/Revision
<b>11<sup>th</sup></b>	<b>1<sup>st</sup></b>	Introduction to performance appraisal methods b) Material and Store Management Introduction functions, and objectives ABC Analysis and EOQ
	<b>2<sup>nd</sup></b>	Marketing and sales Introduction, importance, and its functions
	<b>3<sup>rd</sup></b>	Physical distribution Introduction to promotion mix Sales promotion
<b>12<sup>th</sup></b>	<b>1<sup>st</sup></b>	Financial Management Introductions, importance and its functions
	<b>2<sup>nd</sup></b>	Elementary knowledge of income tax, sales tax, excise duty, custom duty and VAT
	<b>3<sup>rd</sup></b>	Seminar/Case Study /Expert Lecture/Revision
<b>13<sup>th</sup></b>	<b>1<sup>st</sup></b>	Miscellaneous Topics a) Customer Relation Management (CRM) Definition and need Types of CRM
	<b>2<sup>nd</sup></b>	b) Total Quality Management (TQM) Statistical process control
	<b>3<sup>rd</sup></b>	Seminar/Case Study /Expert Lecture/Revision
<b>14<sup>th</sup></b>	<b>1<sup>st</sup></b>	Total employees Involvement Just in time (JIT)
	<b>2<sup>nd</sup></b>	c) Intellectual Property Right (IPR) Introductions, definition and its importance
	<b>3<sup>rd</sup></b>	Seminar/Case Study /Expert Lecture/Revision
<b>15<sup>th</sup></b>	<b>1<sup>st</sup></b>	Infringement related to patents, copy right, trade mark
	<b>2<sup>nd</sup></b>	Seminar/Case Study /Expert Lecture/Revision



**B.K.N. Govt. Polytechnic Narnaul Haryana**  
**Electrical Engineering Department**  
**Lesson Plan**

<b>Name of Faculty</b>	<b>Sh. Kuldeep Mittal</b>
<b>Discipline</b>	<b>Electrical Engineering</b>
<b>Semester</b>	<b>6<sup>th</sup></b>
<b>Subject</b>	<b>Electrical Energy Conservation and Management</b>
<b>Lesson Plan Duration</b>	<b>From 6 March 2023 to 23 June 2023</b>
<b>Work load [Theory + Practical] Per Week</b>	<b>[05]</b>

<b>Week</b>	<b>Theory</b>	
	<b>Lecture Day</b>	<b>Topic</b>
1st	1st	<b>Unit-1 Lighting System:-</b> Basic definitions- Lux, lumen and illumination space to height ratio
	2nd	Types of different lamps and their features
	3rd	Energy efficient practices in lighting
	4th	Tips for energy saving in building - New Building, Existing Building
2nd	5th	Laws of Illumination
	6th	Calculation of illumination at different points, Main requirements for proper lighting
	7th	Macro level approach at design stage
	8th	<b>Unit-2 Energy Conservation and EC Act 2001:-</b> Introduction to energy management, energy conservation, energy efficiency and its need
3rd	9th	Salient features of Energy Conservation Act 2001 & The Energy Conservation (Amendment) Act, 2010 and its importance

	10th	Standards and Labeling - Concept of star rating and its importance, Types of product available for star rating
	11th	<b>Unit-3 Energy Audit:-</b> Types and methodology
	12th	Energy auditing reporting format
4th	13th	Energy audit instruments
	14th	<b>Unit-4 Electrical Supply System and Motors</b> Types of electrical supply system
	15th	Single line diagram
	16th	Transformer loading
5th	17th	Tips for energy savings in transformers
	18th	Motor Loading
	19th	Variation in efficiency and power factor with loading
	20th	Tips for energy savings in motors
6th	21st	Need for energy efficient motors
	22nd	Initial cost versus like cycle cost
	23rd	Cost analysis on life cycle basis
	24th	Various constructional features of EEMs
7th	25th	EEM as compared to standard motors
	26th	<b>Unit-5 Energy Efficiency in Electrical Utilities:-</b> Understanding Electricity Bill, Tariff structure
	27th	Components of power (kW, kVA and kVAR) and power factor
	28th	Concept of sanctioned load, maximum demand, contract demand and monthly minimum charges (MMC)

8th	29th	<b>Pumps:-</b> Introduction to pump and its application. Efficient pumping system operation
	30th	Energy efficiency in agriculture pumps, Tips for energy saving in pumps
	31st	<b>Compressed Air System:-</b> Types of air compressor and its applications
	32nd	Leakage test
9th	33rd	Energy saving opportunities in compressors
	34th	<b>Energy Conservation in HVAC and Refrigeration System:-</b> Introduction
	35th	Concept of Energy Efficiency Ratio (EER)
	36th	Energy saving opportunities in Heating, Ventilation and Air-conditioning (HVAC) and Refrigeration Systems
10th	37th	<b>Thermal Basics:-Types of fuels</b>
	38th	Thermal energy
	39th	Energy contents in fuel
	40th	Energy Units and its conversion in terms of metric tonne of oil equivalent (MTOE).
11th	41st	<b>Unit -6 General Energy Saving Tips:-</b> Lighting System
	42nd	Room Air Conditioners
	43rd	Refrigerators
	44th	Water Heater
12th	45th	Computers
	46th	Fans, Heaters, Blowers and Washing Machines
	47th	Water Pumps
	48th	Kitchens

13th	49th	Transport
	50th	<b>Unit-7 Energy Conservation Building Code:-</b> Haryana ECBC and its salient features including thermal behavior of buildings
	51st	ECBC Guidelines on Building Envelope
	52nd	ECBC Prescriptive Requirements for Building Envelope
14th	53rd	ECBC Guidelines on Heating, Ventilation and Air Conditioning
	54th	ECBC Guidelines on Service Hot Water and Pumping
	55th	ECBC Guidelines on Lighting
	56th	ECBC Guidelines on Electrical Power
15th	57th	ECBC Guidelines on Star Labelling and Minimum Star rating
	58th	<b>STUDENT ACTIVITIES ON ENERGY CONSERVATION/ENERGY</b>
	59th	<b>STUDENT ACTIVITIES ON ENERGY CONSERVATION/ENERGY</b>
	60th	<b>STUDENT ACTIVITIES ON ENERGY CONSERVATION/ENERGY</b>

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**Lesson Plan**

<b>Name of Faculty</b>	<b>Sh. Kuldeep Mittal</b>
<b>Discipline</b>	<b>Electrical Engineering</b>
<b>Semester</b>	<b>6<sup>th</sup></b>
<b>Subject</b>	<b>Industrial Electronics and Control of Drives</b>
<b>Lesson Plan Duration</b>	<b>From 6 March 2023 to 23 June 2023</b>
<b>Work load [Theory + Practical] Per Week</b>	<b>[04+03]</b>

<b>Week</b>	<b>Theory</b>		<b>Practical</b>	
	<b>Lecture Day</b>	<b>Topic</b>		
<b>1<sup>st</sup></b>	<b>1<sup>st</sup></b>	Construction and working principles of an SCR		
	<b>2<sup>nd</sup></b>	Two transistor analogy		
	<b>3<sup>rd</sup></b>	Characteristics of SCR		
	<b>4<sup>th</sup></b>	SCR specifications and rating		
<b>2<sup>nd</sup></b>	<b>5<sup>th</sup></b>	Construction, working principles and V-I characteristics of DIAC.		To draw V-I characteristics of an SCR
	<b>6<sup>th</sup></b>	Construction, working principles and V-I characteristics of TRIAC		
	<b>7<sup>th</sup></b>	Construction, working principles and V-I characteristics of Quadriac		
	<b>8<sup>th</sup></b>	Basic idea about the selection of heat sinks for SCR and TRIACS		
<b>3<sup>rd</sup></b>	<b>9<sup>th</sup></b>	Methods of triggering a Thyristor. Study of triggering circuits		To draw V-I characteristics of a TRIAC
	<b>10<sup>th</sup></b>	----do-----		
	<b>11<sup>th</sup></b>	-----do-----		
	<b>12<sup>th</sup></b>	UJT, its Construction, working principles and V-I characteristics		
<b>4<sup>th</sup></b>	<b>13<sup>th</sup></b>	UJT relaxation oscillator		To draw V-I characteristics of a DIAC
	<b>14<sup>th</sup></b>	Series operation of Thyristors		

	15 <sup>th</sup>	Parallel operation of Thyristors		
	16 <sup>th</sup>	Applications of SCR, TRIACS and Quadriac for light intensity control.		
5 <sup>th</sup>	17 <sup>th</sup>	Application of SCR for speed control of DC and universal motor		To draw uni-junction transistor characteristics
	18 <sup>th</sup>	Application of SCR as a fan regulator		
	19 <sup>th</sup>	Application of SCR as a battery charger.		
	20 <sup>th</sup>	revision		
6 <sup>th</sup>	21 <sup>st</sup>	revision		Observe the output wave of an UJT relaxation oscillator
	22 <sup>nd</sup>	Single phase half wave controlled rectifier with resistive load and inductive load, concept of free wheeling diode		
	23 <sup>rd</sup>	-----do-----		
	24 <sup>th</sup>	-----do----		
7 <sup>th</sup>	25 <sup>th</sup>	Single phase half controlled full wave rectifier		Observe the wave shape across SCR and load of an illumination control circuit
	26 <sup>th</sup>	-----do-----		
	27 <sup>th</sup>	Single phase fully controlled full wave rectifier bridge		
	28 <sup>th</sup>	---do-----		
8 <sup>th</sup>	29 <sup>th</sup>	Three phase full wave half controlled bridge rectifier		
	30 <sup>th</sup>	----do-----		
	31 <sup>st</sup>	Three phase full wave fully controlled bridge rectifier		Fan speed regulator using TRIAC Quadriac (fabrication of this circuit)
	32 <sup>nd</sup>	----do-----		
9 <sup>th</sup>	33 <sup>rd</sup>	Inverter-introduction, working principles		Speed-control of a DC shunt motor or universal motor
	34 <sup>th</sup>	voltage and current driven series and parallel inverters and applications		
	35 <sup>th</sup>	----do-----		
	36 <sup>th</sup>	Choppers-introduction, types of choppers		
	37 <sup>th</sup>	choppers -working principles and applications		To observe the output wave shape on CRO of a Single phase half controlled full wave rectifier
	38 <sup>th</sup>	----do-----		

<b>10<sup>th</sup></b>	<b>39<sup>th</sup></b>	Dual converters-introduction		
	<b>40<sup>th</sup></b>	Dual converters working principles		
<b>11<sup>th</sup></b>	<b>41<sup>st</sup></b>	Dual converters-applications		Single phase controlled rectifier
	<b>42<sup>nd</sup></b>	Cyclo-converters- introduction		
	<b>43<sup>rd</sup></b>	Cyclo-converters- types		
	<b>44<sup>th</sup></b>	Cyclo-converters- applications		
<b>12<sup>th</sup></b>	<b>45<sup>th</sup></b>	DC drives control (Basic Concept)		Use of Variable Frequency Drive for running a 3 phase Induction motor
	<b>46<sup>th</sup></b>	Half wave drives, Full wave drives		
	<b>47<sup>th</sup></b>	Chopper drives AC drives control		
	<b>48<sup>th</sup></b>	Phase control Variable frequency a.c. drives		
<b>13<sup>th</sup></b>	<b>49<sup>th</sup></b>	Constant V/F application Voltage controlled inverter drives		
	<b>50<sup>th</sup></b>	Constant current inverter drives		
	<b>51<sup>st</sup></b>	Cyclo convertors controlled AC drives		
	<b>52<sup>nd</sup></b>	Slip control AC drives		
<b>14<sup>th</sup></b>	<b>53<sup>rd</sup></b>	UPS, Stabilizers,		
	<b>54<sup>th</sup></b>	SMPS		
	<b>55<sup>th</sup></b>	UPS online, off line		
	<b>56<sup>th</sup></b>	Storage devices (batteries) and their maintenance		
<b>15<sup>th</sup></b>	<b>57<sup>th</sup></b>	revision		
	<b>58<sup>th</sup></b>	revision		
	<b>59<sup>th</sup></b>	revision		
	<b>60<sup>th</sup></b>	revision		



**B.K.N. Govt. Polytechnic Narnaul Haryana**  
**Electrical Engineering Department**  
**Lesson Plan**

<b>Name of Faculty</b>	<b>Sh. Rajat Malhotra</b>
<b>Discipline</b>	<b>Electrical Engineering</b>
<b>Semester</b>	<b>6<sup>th</sup></b>
<b>Subject</b>	<b>Electrical Power – II</b>
<b>Lesson Plan Duration</b>	<b>From 6 March 2023 to 23 June 2023</b>
<b>Work load [Theory + Practical] Per Week</b>	<b>[04+03]</b>

Week	Theory		Practical	
	Lecture Day	Topic	Practical Day	Topic
1st	1st	(i) Introduction to the Subject (ii) Introduction of the nature of the examination and marks distribution of different topics	1st	Introduction to the subject and the marks distribution
	2nd	Common type of faults in both overhead and underground systems		
	3rd	Symmetrical/ unsymmetrical faults.		
	4th	Single line to ground fault, double line to ground fault, 3-phase to ground fault open circuit, simple problems relating to fault finding.		
2nd	1st	Test of Chapter 01	1st	Testing of the dielectric strength of transformer oil and air
	2nd	Purpose of protective gear. Difference between switch, isolator and circuit breakers.		
	3rd	Function of isolator and circuit breaker. Making capacity and breaking capacity of circuit breaker (only definition)		
	4th	Circuit breakers. Types of circuit breakers: bulk and minimum oil circuit breakers		
3rd	1st	Air Circuit Breaker	1st	Study of different types of circuit breakers and isolators
	2nd	SF6 circuit breakers		
	3rd	Principles of Arc extinction blast circuit breakers in OCB and ACB		
	4th	Constructional features of OCB, ACB		

4th	1st	Working and Method of arc extinction of OCB and ACB	1st	Plot the time current characteristics of over current relay
	2nd	Miniature circuit breakers MCB, MCCB, ELCB, for distribution and transmission system (Descriptive)		
	3rd	Continued		
	4th	Test of Chapter 02		
5th	1st	Quiz No. 01 from chapter 01 and 02 and assessment of assignment No. 01	1st	Quiz No. 01 and Viva Voce
	2nd	Fuses; function of fuse.		
	3rd	Types of fuses, HV and LV fuses, rewirable, cartridge, HRC		
	4th	Continued		
6th	1st	Earthing: purpose of earthing, method of earthing, Equipment earthing	1st	Power measurement by using CTs and PTs
	2nd	Substation earthing, system earthing as per Indian Electricity rules.		
	3rd	Methods of reducing earth resistance		
	4th	Introduction - types of relays. Electromagnetic and its construction and working		
7th	1st	Thermal relays, their construction and working	1st	Earthing of different equipment/ Main Distribution Board and Energy Meter Box
	2nd	Induction type over-current, earth fault relays		
	3rd	Instantaneous over current relay		
	4th	Directional over-current, differential relays, their functions		
8th	1st	Distance relays, their functions	1st	Quiz No. 02 and Viva Voce
	2nd	Idea of static relays and their applications		
	3rd	Test of Chapter 03		
	4th	Relays for generator protection		
9th	1st	Relays for transformer, protection including Buchholz relay protection	1st	Perform the overload and short circuit test
	2nd	Continued		
	3rd	Protection of feeders and bus bars		

	4th	Over current and earth fault protection.		of MCB as per IS specifications
10th	1st	Distance protection for transmission system	1st	PPT and Viva Voce
	2nd	Relays for motor protection		
	3rd	Test of Chapter 04		
	4th	Quiz No. 02 from chapter 03 and 04 and assessment of assignment No. 01		
11th	1st	Protection of system against over voltages,	1st	Plot the time-current characteristics of Kit-Kat fuse wire
	2nd	causes of over voltages, utility of ground wire		
	3rd	Lightning arrestors, rod gap		
	4th	horn gap, metal oxide type		
12th	1st	Transmission Line and substation protection against over-voltages and lightning	1st	Quiz No. 03 and Viva Voce
	2nd	Continued		
	3rd	Test of Chapter 05		
	4th	Concept of Tariffs		
13th	1st	Block rate, flat rate,	1st	Taking reading of current on any LT line with clamp on meter
	2nd	Numericals		
	3rd	Maximum demand and two part tariffs		
	4th	Numericals		
14th	1st	Test of Chapter 06	1st	Quiz No. 04 and Viva Voce
	2nd	Quiz No. 03 from chapter 05 and 06; assessment of assignment No. 03		
	3rd	Revision test of Chapter 01		
	4th	Revision test of Chapter 02		
15th	1st	Revision test of Chapter 03	1st	Internal Assessment and Viva Voce
	2nd	Revision test of Chapter 04		
	3rd	Revision test of Chapter 05		
	4th	Revision test of Chapter 06		