

| Lesson Plan | | | |
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| Faculty | Mr PARVEEN DABUR & Mr. SAHIL | | |
| Discipline | Electrical Engineering | | |
| Semester | 6th | | |
| Subject | Energy Conservation and Audit | | |
| Duration | 15 Weeks (from 15 January 2026 to 27 April 2026) | | |
| Work Load per Week | Lecture – 02 ; Practical - 02 | | |
| | | Theory | PRACTICALS |
| Week | Lecture Day | Topic | Name of Practical |
| I | 1 | Introduction of the Subject: Energy Conservation and Audit | Introduction of the Lab |
| | 2 | Fundamentals of Energy Conservation | |
| II | 1 | 1.1 Energy Scenario: Primary and Secondary Energy, Energy demand and supply. | 1. Identify star labelled electrical apparatus and compare the data for various star ratings. |
| | 2 | 1.2 Introduction to Energy conservation, energy management , energy efficiency and its need | |
| III | 1 | 1.3 Bureau of Energy efficiency (BEE) and its Roles | 2. Study of various instrument used for energy audit |
| | 2 | 1.4 Star Labelling: Need and its benefits. | |
| IV | 1 | Energy Conservation in Electrical Installation Systems | 3. Use APFC unit for improvement of p. f. of electrical load. |
| | 2 | 2.1 General energy saving tips in Lighting system | |
| V | 1 | 2.2 Energy efficiency measures in fans , water pumps, Room Air Conditioners, Refrigerators, Heaters, Blowers , Washing Machines etc | File checking and Viva voce |
| | 2 | Assignment No 01 | |
| VI | 1 | Test No.01 | 4. Determine the reduction in power consumption by replacement of lighting system in a class room / laboratory. |
| | 2 | 2.3 Energy conservation in Electricity Bill: concept of Electricity billing, Maximum Demand Controller kVAR Controller , Maximum demand controllers; Automatic power factor controllers (APFC) | |
| VII | 1 | Energy Conservation in Electrical Machines | 5. Collect electricity bill of a residential consumer and suggest suitable means for conservation and reduction of the energy bill. |
| | 2 | 3.1 General energy saving tips for transformer and AC/DC motor. | |
| VIII | 1 | 3.2 Energy efficient motor; significant features, advantages, applications and limitations | 6. Prepare an energy audit report for your Institute. |
| | 2 | 3.3 Energy efficient transformers, amorphous transformers; epoxy Resin cast transformer / Dry type of transformer. | |

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| IX | 1 | 3.4 Energy saving factors for the selection of DG system. | File checking and Viva voce |
| | 2 | Assignment No 02 | |
| X | 1 | Test No.03 | 7. Prepare a technical report on energy conservation act 2003. |
| | 2 | Energy Audit of Electrical System | |
| XI | 1 | 4.1 Energy audit : Definition, and Need of energy audit | 8. Prepare a technical report on Energy Conservation Building Code (ECBC). |
| | 2 | 4.2 Types of Energy audit and Instruments used for energy audit | |
| XII | 1 | 4.3 Roles and responsibilities of energy Manager and Accountability | 9. Studying the various energy conservation methods useful in power generation, transmission and distribution. |
| | 2 | 4.4 Energy Audit procedure: Techniques involved in conducting energy audits, including data collection, analysis, and evaluation of energy consumption patterns. | |
| XIII | 1 | Energy Conservation Act | 10. Visit an industry and studying various energy management systems in an industry. Further identify the various energy conservation methods useful in a particular industry |
| | 2 | 5.1 Energy conservation Act 2001: Objectives, features and its amendments. | |
| XIV | 1 | 5.2 Salient features of Energy Conservation Building Code (ECBC): Building Envelope, Comfort System and Controls, Lighting & Controls and Electrical & Renewable Energy Systems. | File checking and Viva voce |
| | 2 | 5.3 Salient features of Eco Niwas Samhita Code (ENS) | |
| XV | 1 | Assignment No 03 | File checking and Viva voce |
| | 2 | Test No.03 | |

Name of the Faculty: Mr. DEVENDER KUMAR

Discipline : Electrical Engineering

Semester : 6th

Subject : HVDC & FLEXIBLE AC TRANSMISSION SYSTEMS

Duration : 15 weeks(from 15 January 2026 to 27 April 2026)

Work load (Lecture/Practical) per week (in Hours):Lecture-03,Practical -00

| Week | Lecture Day | |
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| I | 1 | Introduction of the Subject:HVDC & FLEXIBLE AC TRANSMISSION SYSTEMS |
| | 2 | HVDC Transmission |
| | 3 | 1.1 Introduction to HVDC transmission |
| II | 1 | 1.2 Comparison of AC and DC transmission. |
| | 2 | 1.3 Application of DC transmission system, |
| | 3 | 1.4 Equipment of HVDC transmission systems |
| III | 1 | 1.5 Modern trends in D. C. transmission |
| | 2 | Assignment No.01 |
| | 3 | Test No.01 |
| IV | 1 | HVDC System Control |
| | 2 | 2.1 Principles of dc link control |
| | 3 | 2.2 Types of dc Link |
| V | 1 | 2.3 Starting and Stopping of dc link, |
| | 2 | 2.4 Power control |
| | 3 | 2.5 Harmonics and Filters:, Effects of Harmonics |
| VI | 1 | Sources of harmonic generation, |
| | 2 | Types of filters |
| | 3 | Flexible AC Transmission Systems (FACTS) |
| VII | 1 | 3.1 Objective of FACTS |
| | 2 | Concept of FACTS |
| | 3 | 3.2 Control of power flow in transmission lines, |

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| VIII | 1 | 3.3Application. |
| | 2 | FACTs Controller |
| | 3 | 4.1 Need for compensation |
| IX | 1 | 4.2 Classification of FACTS controllers |
| | 2 | 4.3 Shunt Compensation: |
| | 3 | Objectives of shunt compensation, |
| X | 1 | Methods of controllable VAR generation, |
| | 2 | Static VAR Compensator (SVC), STATCOM. |
| | 3 | 4.4 Series Compensation: |
| XI | 1 | Objectives of series compensation, |
| | 2 | GCSC, TSSC, TCSC and SSSC. |
| | 3 | Combined Controllers Compensation |
| XII | 1 | 5.1 Unified Power Flow Controller: |
| | 2 | Principles of operation, |
| | 3 | comparison with other FACTS controller |
| XIII | 1 | 5.2 Interline Power Flow Controller |
| | 2 | Principles of operation, |
| | 3 | comparison with other FACTS controller |
| XIV | 1 | Assignment No. 03 |
| | 2 | Test No.03 |
| | 3 | Revision of 1 st Unit |
| XV | 1 | Revision of 2 nd and 3 rd Unit |
| | 2 | Revision of 4 th and 5 th Unit |
| | 3 | Previous year Question Papers |

Name of the Faculty: Dr. PRADEEP KUMAR DAHIYA & Ms.GARIMA

Discipline : Electrical Engineering

Semester : 6th

Subject :Entrepreneurship Development and Management

Duration : 15 weeks(from 15 January 2026 to 27 April 2026)

Work load (Lecture/Practical) per week (in Hours):Lecture-03,Practical -00

| Week | Lecture Day | |
|-------------|--------------------|---|
| I | 1 | Introduction of the Subject: Entrepreneurship Development and Management |
| | 2 | Entrepreneurship: Concept and definitions, classification and types of entrepreneurs, |
| | 3 | entrepreneurial competencies, Traits / Qualities of entrepreneurs, manager v/s entrepreneur, |
| II | 1 | role of Entrepreneur, barriers in entrepreneurship, Sole proprietorship and partnership forms of business organisations, |
| | 2 | small business vs startup, critical components for establishing a start up, |
| | 3 | Leadership: Definition and Need, Manager Vs leader, Types of leadership |
| III | 1 | Definition of MSME (micro, small and medium enterprises), significant provisions of MSME Act, |
| | 2 | importance of feasibility studies, technical, marketing and finance related problems faced bynew enterprises, |
| | 3 | major labor issues in MSMEs and its related laws, Obtaining financial assistancethrough various government schemes like Prime Minister Employment Generation. Program (PMEGP) Pradhan Mantri Mudra Yogna (PMMY) |
| IV | 1 | , Make in India, Start up India, Stand up India National Urban Livelihood Mission (NULM); Schemes of assistance by entrepreneurial support agencies at National, State, District level: |
| | 2 | NSIC, NRDC, DC:MSME, SIDBI, NABARD, Commercial Banks, SFC's TCO, KVIB, DIC, |
| | 3 | Technology Business Incubator (TBI) and Science and Technology Entrepreneur Parks (STEP). |
| V | 1 | NATURE AND FUNCTIONS OF MANAGEMENT: Definition, Nature of Management, |
| | 2 | Management as a Process, Management as Science and Art, |
| | 3 | Management Functions, Management and Administration, Managerial Skills |
| VI | 1 | , Levels of Management; Leadership. |
| | 2 | PLANNING AND DECISION MAKING: |

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| | 3 | Planning and Forecasting - Meaning and definition, Features, Steps in Planning Process, |
| VII | 1 | Approaches, Principles, Importance, |
| | 2 | Advantages and Disadvantages of Planning, |
| | 3 | Types of Plans, Types of Planning, |
| VIII | 1 | Management by Objective. |
| | 2 | Decision Making-Meaning, Characteristics. |
| | 3 | ORGANISING AND ORGANISATION STRUCTURE: |
| IX | 1 | Organising Process - Meaning and Definition, Characteristics Process, |
| | 2 | Need and ImportancePrinciples, Span of Management |
| | 3 | Organisational Chart - Types, |
| X | 1 | Contents, Uses, Limitations, |
| | 2 | , Factors Affecting Organisational Chart. |
| | 3 | , STAFFING: Meaning, Nature, Importance, Staffing process. |
| XI | 1 | Manpower Planning, Recruitment, Selection, |
| | 2 | Orientation and Placement, Training, Remuneration. |
| | 3 | CONTROLLING AND CO-ORDINATION |
| XII | 1 | Controlling - Meaning, Features, Importance, Control Process, |
| | 2 | Characteristics of an effective control system, |
| | 3 | Types of Control. Coordination -characteristics, essentials. |
| XIII | 1 | Market Survey and Opportunity Identification, |
| | 2 | Scanning of business environment, Assessment ofdemand and supply in potential areas of growth, |
| | 3 | Project report Preparation, Detailed project report including technical, |
| XIV | 1 | economic and market feasibility, Common errors in project report preparations, |
| | 2 | Exercises on preparation of project report. |
| | 3 | Assignments |
| XV | 1 | Revision of 1 st Unit |
| | 2 | Revision of 2 nd and 3 rd Unit |
| | 3 | Revision of 4 th and 5 th Unit |

| Lesson Plan | | | |
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| Faculty | Ms. RENU(VF) & Mr.PARDEEP KUMAR | | |
| Discipline | Electrical Engineering | | |
| Semester | 6th | | |
| Subject | Installation and Maintenance of Electrical Equipment | | |
| Duration | 15 Weeks (from 15 January 2026 to 27 April 2026) | | |
| Work Load per Week | Lecture – 02 ; Practical - 02 | | |
| | | Theory | PRACTICALS |
| Week | Lecture Day | Topic | Name of Practical |
| I | 1 | Introduction of the Subject: Installation and Maintenance of Electrical Equipment | Introduction of the Lab |
| | 2 | Tools and Accessories for Installation and Maintenance 1.1 Tools: Tools, accessories and instruments required for installation, maintenance and repair work. | |
| II | 1 | Workmen’s safety devices. Underground cable handling equipment. using fire extinguisher for safety against fire. | 1. Write IE rules related to safety and demonstrate the steps taken when a person comes in contact with a live wire. |
| | 2 | 1.2 IER rules: Knowledge of Indian Electricity rules, safety codes, causes and prevention of accidents. Meaning of Authorized persons, anti-climbing devices and danger plates, caution notice. | |
| III | 1 | Clearances rules for crossing of transmission and distribution line to roads, streets, power/telecommunication lines, river and railway line. | 2. Study of tools, accessories and instruments required during installation, maintenance and repair of electrical equipment. |
| | 2 | 1.3 Necessity of Maintenance, Types of maintenance. | |
| IV | 1 | Installation and maintenance of transmission and Distribution lines 2.1 Installation of Line: Method of erection of steel structures and pole support. | 3. Study the steps required for erection of steel structure along with connection of all accessories viz. jumpers, tee points, insulators, joints etc. during installation of a transmission line. |
| | 2 | Connection of jumpers, tee-off points, joints and dead ends. Earthing of transmission lines and guarding. | |
| V | 1 | Arrangement for different types of insulators. Installation and use of Bird guards, earth wire and guy wires. | 4. Measure insulation resistance of Three-phase PVC cable in a distribution board. |
| | 2 | Laying of service lines, provision of service fuses, installation of energy meters. | |
| VI | 1 | 2.2 Maintenance of Line: Patrolling and visual inspection of lines, special inspections and night inspections. | 5. Study of steps required for erection of distribution line along with connection of all accessories viz. jumpers, tee points, insulators, joints etc. during installation of a distribution line. |
| | 2 | Permit to work, arranging of shut downs personally, temporary earthing, cancellation of permit and restoration of supply. | |

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| VII | 1 | Maintenance schedule of busbars, isolating switches, Relays, circuit breakers, LT switches. | 6. Study of tests done at the time of commissioning of transmission and distribution line as per IS standards. |
| | 2 | Installation and Maintenance of Underground Cables 3.1 Installation of Cable: Inspection, storage, transportation and handling of cables. | |
| VIII | 1 | Clearances from other department such as Municipal, Highway authorities, railway, etc. | 7. Prepare list of all electrical accessories required for installation of Pole mounted substation, Plinth mounted substation. |
| | 2 | Different methods of laying cable. Introduction to Cable filling compounds, Epoxy resin and hardeners. | |
| IX | 1 | 3.2 Maintenance of Cable: Cable jointing and termination. | 8. Study of various pre-installation tests as per IS standard done on following electrical equipment viz Electrical motors, Electrical Generators, Transformers and Underground cables. |
| | 2 | Assignment | |
| X | 1 | Test | 9. Study of various pre-commissioning tests as per IS standard done on following electrical equipment viz Electrical motors, Electrical Generators, Transformers and Underground cables. |
| | 2 | Installation and Maintenance of Electrical Machine 4.1 Installation of Machine: Inspection and handling of transformers and motors. | |
| XI | 1 | Installation of power and distribution transformers. Installation of CT and PT. Dehydration of Transformer. | 10. Prepare maintenance schedule of Power transformer. |
| | 2 | 4.2 Maintenance of Machine: Preventive Maintenance schedule of transformer below and above 1000KVA. | |
| XII | 1 | Maintenance schedule of CT and PT. Preventive Maintenance schedule of motors, over hauling of motors, trouble shooting of electric motors. | 11. Prepare maintenance schedule of Distribution Transformer. |
| | 2 | Testing and Commissioning of Electrical Equipment 5.1 Testing of insulator. | |
| XIII | 1 | 5.2 Testing of transmission and distribution line before commissioning. | 12. Prepare maintenance schedule of Motors. |
| | 2 | 5.3 Testing of electrical motor. | |
| XIV | 1 | 5.4 Testing of transformers. | File checking and Viva voce |
| | 2 | Test | |
| XV | 1 | Assignments | File checking and Viva voce |
| | 2 | Revision | |

| Lesson Plan | | | |
|--------------------|--|---|---|
| Faculty | Ms.MINAKSHI | | |
| Discipline | Electrical Engineering | | |
| Semester | 6th | | |
| Subject | Power System Protection | | |
| Duration | 15 Weeks (from 15 January 2026 to 27 April 2026) | | |
| Work Load per Week | Lecture – 03 ; Practical - 02 | | |
| | | Theory | PRACTICALS |
| Week | Lecture Day | Topic | Name of Practical |
| I | 1 | Introduction of the Subject: Power System Protection | Introduction of the power System Lab |
| | 2 | Introduction of Faults | |
| | 3 | 1.1 Common type of faults in both overhead and underground systems. | |
| II | 1 | 1.2 Types of Symmetrical faults: Three phases to ground and Three Phase fault. | 1. Identify various switchgears installed in the laboratory and write their specifications. |
| | 2 | 1.3 Types of Unsymmetrical faults: Line to line fault, Single line to ground fault, | |
| | 3 | double line to ground fault, Line to line and third line to ground fault. | |
| III | 1 | Assignment No 01 | 2. Test HRC fuse by performing the load test. |
| | 2 | UNIT II | |
| | 3 | Introduction of Switchgears 2.1 Definition of switchgear, Purpose of switchgear. | |
| IV | 1 | Function of, switch, fuse, isolator and circuit breaker. | 3. Perform the overload and short circuit test of MCB as per IS specifications. |
| | 2 | Difference between fuse and circuit breaker. | |
| | 3 | 2.2 Circuit Breaker: Operating principle of circuit breaker. Arc phenomenon. Methods of Arc extinction. | |
| V | 1 | Definition of Arc voltage, Restriking and Recovery voltage, | 4. Plot the time-current characteristics of Kit-Kat fuse wire. |
| | 2 | Rate of rise of restriking voltage (RRRV). Rating of Circuit breakers: making capacity, breaking capacity, short time capacity. | |
| | 3 | 2.3 Types of Circuit Breakers: Constructional and working of Oil circuit breakers, Air Blast Circuit Breaker, | |
| VI | 1 | SF6 circuit breakers, VCB. | 5. Perform Earthing of different equipment installed in the institute viz Motors, Generators, Energy Meter, Main Distribution Board and Energy Meter Box. |
| | 2 | Test No 01 | |
| | 3 | Introduction of Protection Devices | |
| VII | 1 | 3.1 Fuses: Properties and Characteristics of fuse, | 6. Plot the time current characteristics of over current relay. |
| | 2 | Types of Fuse: HV and LV fuses, rewire-able, cartridge, HRC. | |
| | 3 | 3.2 Earthing: Purpose of earthing, method of earthing, | |

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| VIII | 1 | Equipment earthing, Substation earthing, Methods of reducing earth resistance. | 7. To write down specifications of Lightning arrestors installed in a substation. |
| | 2 | 3.3 Basic relay terminology- Protective relay, Relay time, Pick up, Reset current, current setting, Plug setting multiplier, Time setting multiplier. | |
| | 3 | 3.4 Protective relays: Classification, principle of working, construction and operation of – Electromagnetic (Attracted armature type, Induction) relay, | |
| IX | 1 | Thermal relay. Block diagram and working of Static relay. | 8. Power measurement by using CTs and PTs. |
| | 2 | i. Over-current relay: Principle, operation of instantaneous over current relay, Inverse definite minimum time (IDMT) over current relay. | |
| | 3 | ii. Directional over-current: operation of Directional over-current. | |
| X | 1 | iii. Differential relay: operation of Differential relay. | 9. Measurement of current on any LT line with clip meter. |
| | 2 | iv. Distance relays: Impedance relay, mho relay. | |
| | 3 | Assignment No 02 | |
| XI | 1 | UNIT IV Protection scheme 4.1 Protection for Alternator: Differential protection over current, | 10. Study of different types of circuit breakers and isolators by visiting power station and to prepare detailed report. |
| | 2 | Earth fault protection scheme. | |
| | 3 | 4.2 Protection for transformer: Buchholz protection scheme, | |
| XII | 1 | differential protection scheme. | 11. Prepare charts on different Generating stations in our state mentioning their locations. |
| | 2 | 4.3 Protection for Feeder and transmission line - time graded and over current protection, | |
| | 3 | current graded system, differential protection | |
| XIII | 1 | UNIT V Over-Voltage Protection 5.1 Causes of over voltages: Internal and external causes, | 12. Students may be taken to various Sub-stations/Grid Stations for study the differential protection of transformer. |
| | 2 | types of lighting strokes. | |
| | 3 | 5.2 Protection against Overvoltage and Lightning: ground wire, | |
| XIV | 1 | earthing screen, surge diverters or lightning arresters. | File checking and Viva voce |
| | 2 | 5.3 Types of Lightning arresters: rod gap, horn gap, | |
| | 3 | metal oxide type. | |
| XV | 1 | Test No 03 | File checking and Viva voce |
| | 2 | Assignments No 03 | |
| | 3 | Revision | |