



மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்

MANONMANIAM SUNDARANAR UNIVERSITY

**SYLLABUS FOR DIPLOMA IN ELECTRICAL AND ELECTRONICS
PROGRAM OFFERED THROUGH DIRECTORATE OF VOCATIONAL
EDUCATION (COMMUNITY COLLEGES AND VOCATIONAL SKILL DEVELOPMENT
CENTRES) FROM 2019 - 2020**



கல்விசார் நிலைக்குழுக் கூட்டம்

**MEETING OF THE STANDING COMMITTEE ON
ACADEMIC AFFAIRS HELD ON FRIDAY
THE 28th JUNE 2019**

DIPLOMA IN ELECTRICAL AND ELECTRONICS

மின் மற்றும் மின்னணுவியல் பட்டயம்

SCHEME OF EXAMINATION

Subject code	Title of Course	Credit	Hours	Passing Minimum
Semester I				
C19EE11/E19EE01	Electrical Machines	6	90	40/100
C19EE12/E19EE02	Measurements and Instrumentation	6	90	40/100
C19EE13/E19EE03	Industrial Electronics	6	90	40/100
C19CE10/E19CE10	Communicative English	6	90	40/100
C19EEP1/E19EEP1	Practical I – Electrical Machines and Electronics	4	120	40/100
Semester II				
C19EE21/E19EE04	Operation and Maintenance of Electrical Equipments	6	90	40/100
C19EE22/E19EE05	Electrical Estimation and Energy Auditing	6	90	40/100
C19LS23/E19LS05	Life Skill	6	90	40/100
C19EEP2/E19EEP2	Practical II – Electrical Workshop	4	120	40/100
C19EEPW/E19EEPW	Project Work	10	150	40/100

Eligibility for admission: Pass in 12th Std. Examination Conducted by the Govt. of Tamil Nadu Board of Secondary Education, Government of Tamilnadu (or) Any Other Equivalent Examination

Examination: Passing minimum for each Course is 40%.classification will be done on the basis percentage Marks of the total marks obtained in all of the Courses and given as below:

- 40% but less than 50% - Third Class
- 50%but less than 60% - Second Class
- 60% and above - First Class

Theory Paper

Internal Marks-25

External Marks-75

Syllabus

Semester I

Course I	:	Electrical Machines
Course II	:	Measurements and Instrumentation
Course III	:	Industrial Electronics
Course IV	:	Communicative English
Course V	:	Practical I – Electrical Machines and Electronics

Semester II

Course VI	:	Operation and Maintenance of Electrical Equipments
Course VII	:	Electrical Estimation and Energy Auditing
Course VIII	:	Life skill
Course IX	:	Practical II - Electrical Workshop
Course X	:	Project Work

***(Semester Pattern for Community College Only)**

Program Objectives

- Decide the suitability of dc generator, motor, alternator, induction motor & transformer for particular purpose.
- To study the construction and working of single phase, three phase energy meter and study about calibration
- To study the construction and working of Power factor meters, and phase sequence indicators
- Study the working principle of clippers and clampers

Semester I
Course I
(C19EE11/E19EE01)**Electrical Machines**

Objectives

The students should be able to:

- Know the constructional details & working principles of dc machines, ac machines and transformers.
- Evaluate the performance of dc generators, motors, alternators, induction motor & transformers.
- Decide the suitability of dc generator, motor, alternator, induction motor & transformer for particular purpose.
- Write the specifications of dc machines, ac machines & transformers as per requirement.
- Know the constructional details, working principle, testing.

Unit I

18 Hrs

D C Generators

Review of electromagnetic induction – Faraday’s laws – Fleming’s right hand rule – Principle of operation of D.C. generators – Construction of D.C. generators – Field system– Types of armature windings – Principles of lap and wave windings –Types of D.C. generators – Building up of voltage of D.C. Shunt generators - No load characteristics of Shunt generator – Determination of critical field resistance – Causes of failure to build-up voltage and remedy – Load characteristics of series and shunt generators – load characteristics of cumulatively and differentially compounded generators – Applications.

Unit II

18 Hrs

D C Motors

Principle of operation of D.C. Motors – Fleming’s left hand rule – Construction – Back emf – Torque equation – Types of motors – Torque-current, Speed-current, Speed-Torque characteristics of different motors – Speed control of DC motors – Field control and armature control– necessity of Starters– 3 Point and 4 Point starters – losses in D.C. Machines –Applications of D.C. Motors.

Unit III

18 Hrs

Single Phase and Three Phase Transformers

Principle of operation – Constructional details of core, shell type transformers – coil assembly – Voltage ratio – Transformer on No load – Transformer on load – Current ratio – O.C. test, S.C. test – Parallel operation of single phase transformers– Auto transformer – principle – saving of copper – applications. Three phase Transformer construction – Types of connections – Star-star, Star-Delta, Delta-Star, Delta-delta connections – Parallel operation of three phase transformers – Conditions –Cooling of transformers – Various cooling arrangements – Transformer accessories – conservator – breather – explosion vent – Buchholz relay–ON load and OFF load tap changer – Transformer oil tester – Acidity test -- Earthing – Measurement of earth resistance.

Unit IV

18 Hrs

Alternator Principles and Construction

Basic principle of alternators – Types of alternators –Stationary armature rotating field – advantages of rotating field – Construction details of alternator – Salient pole rotor – Cylindrical type rotor – Types of A.C. armature windings – Types of slots – Full pitch and short pitched windings – Phase spread angle and effect of distribution factor – pitch factor – relation between frequency, speed and number of poles – EMF equation Simple Problems – methods of obtaining sine wave – Critical speed of rotor – Ventilation of turbo alternators – advantages of hydrogen cooling and its precaution – excitation and exciters.

Unit V

18 Hrs

A) Single Phase Induction Motor

Single phase induction motors – not self starting –methods of making itself starting – construction, working principle–phasor diagram-slip torque characteristics- split phase motor - capacitor motor - shaded pole motor - repulsion motor - universal motor – operation of three phase motor with single phase supply.

B)Three Phase Induction Motor

Rotating magnetic field – Principle of operation of three phase induction motors - speed control of induction motors. Starters of induction motors – direct on line starter and its merits for cage motors – star delta starter- auto transformer starter -rotor resistance starter – cogging –crawling in induction motor– double cage induction motor-induction generator.

Reference Books

- A Text Book Of Electrical Technology Vol II - B.L. Theraja - S.Chand & Co.New Delhi
- Electrical Technology - Edward Hughes - Addison – Wesley International Student Edition
- Electrical Machines – Nagarath - TMH Publications
- Electrical Machines – Bhattacharya - TMH Publications Edition

Course II

(C19EE12/E19EE02)Measurements and Instrumentation

Objectives

- To define basic measurement terms.
- To learn about various operating forces and effects used in instruments.
- To study the construction and working of Moving coil and Moving Iron instruments, CT and PT and electrostatic voltmeter.
- To understand the measurement of resistance using different means.
- To study Single phase and Three phase power measurement using wattmeter.
- To study the construction and working of single phase, three phase energy meter and study about calibration
- To study the construction and working of Power factor meters, and phase sequence indicators.
- To study about the frequency measurement using different types of frequency meters.
- To learn about the measurement of inductance and capacitance using bridges.
- To study about CRO and its applications.

Unit I

18 Hrs

Classification and Characteristics of Instruments

General - Definition of Measurement – functions of Measurement system (Indicating, Recording and controlling function) – Applications of measurement systems – classification – Absolute and secondary instruments – Indicating Recording and Integrating Instruments –Analog and Digital – Definition of True value, accuracy, precision, error and error correction – Instrument efficiency – Effects used in instruments – operating forces – Deflecting, controlling and damping forces – constructional details of moving system – Types of Supports - Balancing – Torque weight ratio – control system (spring control and gravity control) Damping systems – Magnets – pointers and scales

Unit II

18 Hrs

Measurement of Current, Voltage and Resistance

Types of Instruments – construction, working and torque equation of moving coil, Moving iron, dynamometer type (Shaded pole) Instruments – Extension of instrument range using shunts and multipliers. (Calculation, requirements and simple problems).

Tong tester – Electrostatic voltmeter – Rectifier type instruments – Instruments transformers CT and PT – Testing, Errors and characteristics of CT and PT - Classification of Resistance – measurement using conventional method – (Ammeter – voltmeter method) Measurement of low resistance using Kelvin's Bridge ohmmeter – measurement of Medium resistance using Wheatstone bridge – High resistance using Megger - earth resistance- – using Earth tester – Multimeters.

Unit III**18 Hrs****Measurement of Power and Energy**

Power in D.C and A.C Circuits – watt meters in power measurement – Electro dynamometer type and LPF watt meters – Three phase power measurement using Three phase wattmeter-Reactive power measurement in balanced load Measurement of Energy in AC circuits – Single phase and Three phase energy meters construction and operation – Errors and Error correction – calibration using RSS meter - Digital Energy meter.

Unit IV**18 Hrs****Measurement of Power Factor, Frequency and Phase Difference**

Power factor meters – single phase and Three phase Electro dynamometer type – construction and working – phase sequence Indicator – phase difference measurement using synchroscope –Tri-vector meter – Merz price maximum demand Indicator. Frequency measurement – Frequency meter – Weston type – Digital Frequency meter – (Simplified Block diagram

Unit V**18 Hrs****Measurement of L,C and Waveforms**

Measurement of Inductance – Maxwell's Inductance bridge – Andersons bridge – Measurement of capacitance using Schering bridge.CRO – Block diagram – CRT – Applications -Measurements of voltage, frequency and phase difference using CRO - Time base and synchronization – Dural trace CRO – Digital storage oscilloscope – Block diagram

Reference Books

1. A Course in Electrical and Electronics Measurements and Instrumentation- A.K. Sawhney, PuneetSawhney - DhanpatRai& Co (P) Ltd., New Delhi 1993
2. Electronics and Instrumentation - Dr.S.K.Battachariya,Dr. RenuVig - S.K. Kataria& Sons, New Delhi
3. A course in Electrical and Electronic Measurement and Instrumentation – UmeshSinha - SatyaPrakashan New Delhi

Course III
(C19EE13/E19EE03)Industrial Electronics

Objectives

On completion of the following units of syllabus contents, the students must be able to study

- The working principle of PN junction diode and transistor
- Understand the working principle of different types of rectifiers Understand the different
- Transistor configurations Differentiate various types of amplifiers
- Study the performance of special devices like UJT, FET Study the performance of different
- Transistor oscillators Study the performance of SCR, DIAC, and TRIAC
- Study the performance and types of MOSFET
- Study the different modes of operations of MOSFET
- Know the construction and working principle of optoelectronic devices Study the performance of solar cell with principle and applications
- Explain the concept of wave shaping circuits
- Study the working principle of clippers and clampers
- Draw, explain and state the application for commutation circuits and trigger circuits of SCR.
- Familiarize the phase controlled rectifier and know the applications of the phase controlled rectifier.
- Draw and describe the working of half wave controlled rectifier circuit with R and RL load, single phase Semi Converter Bridge, Single phase full Converter Bridge for RL load, single phase and three phase full converter with RL load.
- Understand the working choppers and inverters. Know the applications of choppers.
- Explain the various types of choppers with circuit diagram

Unit I

18 Hrs

Semiconductor and Diodes:

Semiconductor-Definition, classification, intrinsic and extrinsic N type & p type – drift current & diffusion current diodes – PN junction diode – forward and Reverse bias characteristics – specification – zener diode construction & working Principle-characteristics-zener break down-avalanche break down-zener Diode as a voltage regulator –applications- specifications

Rectifier – introduction-classification of rectifiers-half wave rectifier-full wave rectifier(center tapped, bridge)-(no mathematical equations) - comparison - Applications-filters-C, LC and PI filters

Unit II

18 Hrs

Transistor – NPN and PNP transistor – operation-transistor as an amplifier-transistor as a switch – transistor biasing – fixed bias, collector base bias, self bias – CB,CE,CC configurations – characteristics - comparison between three configurations in terms of input impedance, output impedance, current gain, voltage gain – classification of amplifiers- RC coupled amplifier – emitter follower and its application – negative feedback concept, effect of negative feedback – types of negative feedback connections

Transistors oscillator – classifications – condition for oscillators(Barkhausen Criterion) – General form of LC oscillator - Hartly oscillator – Colpitts oscillator – RC phase shift oscillator, Crystal Oscillator.

Unit III

18 Hrs

FET, UJT and Opto Electronics Devices and wave shaping circuits

FET and UJT:

Field Effect Transistor – construction – working principle of FET – difference between FET and BJT – classification of FET – characteristics of FET – Applications – FET amplifier (common source amplifier) - Uni junction Transistor – construction – equivalent circuit – operation – characteristics – UJT as a relaxation oscillator

Opto Electronics Devices and wave shaping circuits:

Classification of opto electronic devices – symbols, Characteristics, working of LDR, LED, 7 segment LED and LCD– optocoupler - Photo transistor. Clipper, Clamper Circuits and waveforms only – Solar Cell Principles – Mention of Applications Astable, Monostable and Multivibrators using transistor - Schmitt Trigger using transistor.

Unit IV

18 Hrs

SCR, DIAC, TRIAC & MOSFET:

SCR – introduction – working – comparison between SCR and transistor – VI characteristics – SCR as a switch, controlled rectifier – TRIAC working principle Characteristics – DIAC – characteristics – DIAC as bi- directional switch. MOSFET – types & characteristics of both N,P channel MOSFET-

Characteristics of enhancement and depletion mode MOSFET – MOSFET as a switch. Mention of applications of SCR, TRIAC, DIAC and MOSFET - Triggering Circuits for Thyristor-Resistance Triggering Circuits - RC Trigger Circuits - UJT based Trigger Circuits- Driver and Buffer Circuits for Thyristor- Thyristor Commutation Techniques-Class A, Class B, Class C, Class D, Class E.

Unit V

18 Hrs

Line Commutated And Force Commutated Converters

Line Commutated Converters - Line Commutated Converters(Controlled Rectifiers)- Principle of Phase Controlled Converter Operation -Single Phase Full Converters -Single Phase Dual Converters -Three Phase Full Converters - Three Phase Dual Converters - Cyclo Converters-Single Phase Cyclo Converters -Three Phase Cyclo Converters.

Forced Commutated Converters - Dc-Dc Switch-Mode Converters(Choppers)-Control of DC- DC Converters -Step-Down(BUCK) Converter - Step-Up(BOOST) Converters -BUCK- BOOST Converters

Applications - Switch Mode Power Supplies-Full Bridge Converter Type - Uninterrupted Power Supply-ON line(No Break) and OFF line(Short-Break)

Reference Books

- Electronics Devices & Circuits - Salivahanan S, N.Suresh Kumar, A.Vallavaraj -Tata McGraw Publication - 3rd Edition 2016
- Electronic Principles – Malvino -Tata McGraw Hill Publication – 2010
- Electronic Devices & Circuits - Allen Mottershed - PHI
- Electronics Devices & Circuits - Jacob Millman and Halkias -Tata McGraw Hill – publication - 3rd Edition 2010
- Power Electronics - MD Singh, KB - McGraw Hill Publishing Company, New Delhi, Seventeenth reprint 2005
- Power Electronics – A - Mohammed H.Rashid - New Age Publication – Third Edition,2004
- Power Electronics – B - Mohan, Undeland, Robbins - Wiley India Edition, Media Enhanced Third Edition
- Power Electronics – C - Dr.P.S.Bimbhra – Khanna Publishers, Fourth Edition, 2011.
- Power Electronics – D - M.S.Jamil Asghar - PHI Learning Private Limited Eastern Economy Edition, 2010

Course IV
(C19CE10/E19CE10)**Communicative English**

1. **Basic Grammar:**
 - a. Review of grammar
 - b. Remedial study of grammar
 - c. Simple sentence
 - d. Word passive voice etc.
2. **Bubbling Vocabulary:**
 - a. Synonyms
 - b. Antonyms
 - c. One – work Institution
3. **Reading and Understanding English**
 - a. Comprehension passage
 - b. Précis – writing
 - c. Developing a story from hints.
4. **Writing English**
 - a. Writing Business letters.
 - b. Paragraph writing
 - c. Essay writing
 - d. Dialogue writing
5. **Speaking English**
 - a. Expressions used under different circumstances
 - b. Phonetics

Reference

1. V.H.Baskaran – “English Made Easy”
2. V.H.Baskaran – “English Composition Made Easy”
(Shakespeare Institute of English Studies, Chennai)
3. N.Krishnaswamy – “Teaching English Grammar”
(T.R.Publication, Chennai)
4. “Life Skill” – P.Ravi, S.Prabakar and T.Tamzil Chelvam,
M.S.University, Tirunelveli.

Course V
Practical I

(C19EEP1/E19EEP1)**Electrical Machines and Electronics**

List of Experiments

1. No Load and Load characteristics of self-excited DC shunt Generator.
2. Load Characteristics of self-excited DC series Generator.
3. Load Test on DC shunt motor and draw the Performance Curves.
4. Load Test on DC series motor and draw the performance curve.
5. Speed Control of DC Shunt motor by
 - a) Armature control method.
 - b) Field control method.
6. Load Test on a Single phase Transformer.
7. Load test on 3 phase alternator.
8. Load test on 1 phase induction motor.
9. Calibration of 3 phase energy meter.
10. Measurement of earth resistance by using megger.
11. Construct and plot the VI characteristics of PN junction diode and find the cut-in voltage.
12. Construct and plot the regulation characteristics (by varying either load or line voltage) of Half wave rectifier with and without filters.
13. Construct and draw SCR characteristics and find its break over voltage.
14. Construct and plot the DIAC and TRIAC characteristics.
15. Construct a positive and biased diode clipper and clamper waveforms.
16. Construct and test the open loop speed control circuit for DC shunt motor
17. Construct and test the control circuit using TRIAC for Universal motor.

Semester II

Course VI

(C19EE21/E19EE04) **Operation and Maintenance of Electrical Equipments**

Objectives

- Understand building electrical installation and electrical safety. Understand operation and maintenance of transformer.
- Understand operation and maintenance of Generators, substations and circuit breakers.
- Understand operation and maintenance of AC motors and Starters. Understand operation and maintenance of Lighting transmission and distributions.

Unit I

18 Hrs

Earthing Arrangements, Safe Working On electrical Equipment, Building Electrical installations:

Earthing Arrangements

Points to be earthed, Earthing Procedure, Earth resistance measurement, Action to be taken to reduce earthing resistance, Earth Leakage Protection (ELCB)

Safe Working on Electrical Equipment-

Authorized Person, Procedure for Shutdown, and Testing device for Electricity, Special shutdown precautions in substations and Power House.

Building Electrical Installations-

Points to be inspected, Insulation Resistance Measurement Procedure, Points to be checked in switches & Switches, Points to be inspected in Potable equipment, Action to be taken if an electrical equipment catches fire, Different types of Fire extinguishers & its applications

Unit II

18 Hrs

Operation & Maintenance of Transformer

Forces generated in transformer during short circuit - Noise in operation - Reason for temperature rise- -insulation resistance-Drying out- precaution for parallel in transformer-inrush current and remedy- insulation co-ordination-effect on insulation during star point earthing -transformer maintenance schedule - action to be taken while transformer oil, temperature rises unduly - points to be checked by oil level tends to fall down - attention required for bushing and insulator.

Unit III

18 Hrs

Operation & Maintenance of Generators, Sub-Stations and Circuit Breaker Generators-

Parallel operation of Alternators, Real power and Reactive power adjustment between alternator running in parallel, AVR role, Causes for Alternator fails to buildup, Instability in Alternator, Cyclic speed irregularity, Protective & Indicative equipments for Alternator, Causes for overheating of armature & field winding of Alternators, Causes for circulating current between Alternators running in parallel, Causes for pitting of Alternator bearings, Reverse current protection & its necessity,

Sub-stations and Circuit Breaker-

Difference between Isolator & Circuit breaker, Rupturing capacity of Circuit breaker, Short-circuit calculations, Conditions can a circuit breaker arranged to trip, Auto reclose breaker, Fault clearance time, Inverse time overload relay, Procedure to ensure proper operation of Circuit breaker in the event of a fault, Maintenance requirement for Oil Circuit Breakers, Attention required for the contacts of Contactors, Maintenance requirement of SF6 Circuit breakers

Unit IV

18 Hrs

Operation & Maintenance Ac Motors and Starters

Change the direction of Rotation, Role of Single phase preventer, Types of enclosures, Permissible overload, effect of ambient temperature, Insulation classification, Indicating & Protecting devices for Large Size Motors, If overload mechanism trips frequently what action to be taken, Control devices for motors, role of relays in motor, Points to be attended during periodical maintenance, Air gap measurement, Ball & Roller bearing usage, precautions in fitting bearings, bearing problems, Alignment of directly coupled motors, Static and Dynamic balancing of rotor, Causes of low insulation resistance, rectification of low insulation resistance problem, drying out of motors, Step to be taken if a motor is unduly hot, Vacuum impregnation, Selection of starters for High/Low starting torque applications.

Unit V

18 Hrs

Operation & Maintenance of Lighting, Transmission and Distribution lighting

Glare reduction, Stroboscopic Effect and methods to reduce, Steps in Designing Lighting Installation, Troubleshooting in Fluorescent Lamp and Discharge Lighting, Street Light Control methods, Fluorescent Lamp Disposal, precautions in Erecting Lighting Installations. Symptoms to identify the end of the useful life of Lamp, Causes for lowering of Illumination level

Transmission and Distribution

Permissible limit for variation of voltage/frequency as per IS Standard, Factor of Safety, Safety devices for overhead Transmission lines, Minimum clearance of between conductors & building, Advantages & Limitations of Steel Cored Aluminium Conductors (ACSR), Purpose of continuous earth wire, Points to be checked when carrying out inspection in overhead transmission line, Prevent rusting of Steel post, Protection requirements for Transmission line, Insulation level & Co-ordination, Precautions in erecting UG Cable, Causes for failure of UG Cable, Cable fault locations, Fall of potential method, Murray loop test method, Locating cable discontinuity

Reference Books

1. Operation and Maintenance of Electrical Equipment - B.V.S.Rao - Media Promoters & Publishers Private Limited, Mumbai - 1st Edition, 1st Reprint 2011 – Volume I & II
2. Testing, Commissioning, Operation and Maintenance of Electrical Equipments - S.Rao - Khanna Publishers, Sixth Edition, New 2010 - Delhi

Course VII

(C19EE22/E19EE05) **Electrical Estimation and Energy Auditing**

Unit I

18 Hrs

Systems of Internal Wiring and Earthing

Need of electrical symbols – List of symbols – Brief study of important Indian Electricity Rules 1956 - Methods of representation for wiring diagrams – Looping back system and Joint box system and tree system of wiring - Types of internal wiring – Service connection (Overhead and Underground) - Protection of electrical installation against overload, short circuit and earth fault – protection against electric shock – Effects of electric shock –Recommended first aid for electric shock - Treatment for electric shock - Construction and working of ELCB – Overview of Busbar Trunking and Cable tray.Necessity – General requirements of Earthing – Earthing and Soil Resistivity – Earth electrodes – Methods of earthing -Plate earthing - Pipe earthing - Rod earthing – Soil Resistivity –Methods of improving earth resistance - Size of earth continuity conductor - Difference between Neutral and Earth Wires. Safety signs showing type of PPE to be worn, Prohibition Signs, Warning Signs, Mandatory Signs, Advisory or Safe Condition Signs.

Unit II

18 Hrs

Domestic and Industrial Estimate

General requirements of electrical installations for Residential, Commercial and Industrial – Lighting and power sub-circuits – Diversity factor for sub circuits -Location of outlets, control switches, main board and distribution boards – Permissible voltage drops and size of wires - Steps to be followed in preparing electrical estimate. Estimate the quantity of material required in Electrical Installation for

1. Small residential building/Flat
2. Factory Lighting scheme
3. Computer centre having 10 computers, a/c unit, UPS, light and fan.
4. Street Light service having 12 lamp light fitting
5. Workshop with one number of 3 Φ , 15hp induction motor.
6. Small Workshop with 3 or 4 Machines.

Unit III

18 Hrs

Energy Management & Audit and Electrical system

Energy Management & Audit

Definition, Energy audit- need, Types of energy audit, Energy management (audit) approach- Understanding energy costs, Bench marking, Energy performance, Matching energy use to requirement, Maximizing system efficiencies, Optimizing the input energy requirements, Fuel and energy substitution, Energy audit Instruments.

Electrical system

Electricity billing, Electrical load management and maximum demand control, Power factor improvement and its benefit, Selection and location of capacitors, Performance assessment of PF capacitors, Distribution and transformer losses.

Unit IV

18 Hrs

Electric Motors & Lighting System

Electric Motors

Types, Losses in induction motors, Motor efficiency, Factors affecting motor performance, Rewinding and motor replacement issues, Energy saving opportunities with energy efficient motors.

Lighting System

Light source, Choice of lighting, Luminance requirements, and Energy conservation avenues.

Unit V

18 Hrs

Diesel Generating System & Energy Efficient Technologies in Electrical Systems

Diesel Generating system

Factors affecting selection, Energy performance assessment of diesel conservation avenues.

Energy Efficient Technologies in Electrical Systems:

Maximum demand controllers, Automatic power factor controllers, Energy efficient motors, Soft starters with energy saver, Variable speed drives, Energy efficient transformers, Electronic ballast, Occupancy sensors, Energy efficient lighting controls, Energy saving potential of each technology

Reference Books:

1. Electrical Design Estimating And Costing - K. B. Raina & S. K. Battacharya, New age International Ltd
2. Electrical Wiring, Estimating and Costing - Dr. S. L. Uppal G.C. Garg Khanna publishers – Sixth 2011

Course VIII

(C19LS23/E19LS05) **Life Skill**

I Life Coping or adjustment

- (a) External and internal influence in one's life
- (b) Process of coping or adjustment
- (c) Coping with physical change and sexuality
- (d) Coping with stress, shyness, fear, anger far live and criticism.

II Attitude

- (a) Attitude
- (b) Self acceptance, self – esteem and self actualization
- (c) Positive thinking

III Problem Solving

- (a) Goal Setting
- (b) Decision Making
- (c) Time Management and stress Management.

IV Computers

- (a) Introduction to Computers
- (b) M.S.Office
- (c) Power Point

V Internet

- (a) Introduction to internet
- (b) E – mail
- (c) Browsing

References

- 1) Life Skill Programme course I & II by Dr. Xavier Alphona MCRDCE Publications. R.K.Mutt Road, Chennai – 28
- 2) ஆளுமை பண்பு வளர்த்தல் மற்றும் தகவல் தொடர்பு by M.Selvaraj Community College, Palayamkottai
- 3) “Life Skill” –P.Ravi, S.Prabahar & T.Tamil Chelvam, M.S. University, Tirunelveli

Course IX
(C19EEP2/E19EEP2)
Practical II – Electrical Workshop

1. Wiring Section

Objective

- At the end of this course, the students will be able to identify, select and use various wires and colour codes.
- Adopt safety practices while working with power supply.
- Able to know about the basic tools and measuring equipment.
- To understand the importance of earthing. Identify and make use of different electrical fittings and accessories.
- Read and understand circuit diagram and symbols.
- Practice simple wiring based on the circuit.
- Ability to use multimeter for measurements.

Exercises

1. Familiarization of tools used for electrical repair work and personal protection Equipments.
2. One lamp controlled by one way switch. Measure and check the voltage and current.
3. Simple Wiring circuit to glow fluorescent lamp .
4. Connect two lamps in series and parallel with switch control in a board.
5. Staircase wiring using two way switch.
6. Connect the LED Bulb, Tube light, and One Plug point socket with individual Switch control in a board.

2. Plumbing Section

Objective:

- Identify, select and use various plumbing tools and components
- To install pipes and accessories.
- To repair or replace components in case of water leakages.
- To make use of GI and PVC pipes, pipe fittings and accessories.
- To know about different plumbing layouts and pipe joints.
- Pipe threading using standard die sets.

Exercises

1. Cutting, Bending and External Threading of GI pipes using die.
2. Install a sink/washbasin with tap using PVC pipe and accessories such as gate valve, bend/ Elbow, tee, coupling, water meter etc., with draining system.
3. Provide the hot water tap connection from water heater with required fittings.
4. Repair a Leakage in the water tap and fix water meter.
5. Lay pipes to collect rain water from various types of roofs and install rain water harvesting system.
6. Erection of mono block pump with suction and delivery pipe connection along with foot valve using PVC pipes and accessories

Course X
(C19EEPW/E19EEPW)Project Work

OBJECTIVES:

- Implement the theoretical and practical knowledge gained through the curriculum into an application suitable for a real practical working environment preferably in an industrial environment
 - Get exposure on industrial environment and its work ethics. Understand what entrepreneurship is and how to become an entrepreneur.
 - Learn and understand the gap between the technological knowledge acquired through curriculum and the actual industrial need and to compensate it by acquiring additional Knowledge as required.
 - Carry out cooperative learning through synchronous guided discussions within the class in key dates, asynchronous document sharing and discussions, as well as to prepare collaborative edition of the final project report.
 - Understand the facts and importance of environmental management. Understand and gain knowledge about disaster management.
- a) Internal assessment mark for Project Work & Viva Voce:
Proper record to be maintained for the two Project Reviews.
- b) Allocation of Mark for Project Work & Viva Voce in Board Examination:
- c) Internship Training
