



# Neptune Institute of Management & Technology

(Established Under R.S. (XXI of 1860) Act of Govt. of NCT of Delhi)

(ISO 9001 - 2000 Internationally Certified Institute)

## Syllabus: Diploma in Electrical Engineering

COURSE	Diploma in Electrical Engineering (D.E. – Electrical)
Min. Qualification	10th with 2 yrs. exp.
Course Fees	Rs. 6,000/- per sem.
Exam Fees	Rs.1,000/- per sem.
Reg. Fees	Rs.1,000/- per sem.
Duration	1 sem to 6 sem.
Subject Covered	<p><b>Ist Sem</b></p> <ol style="list-style-type: none"> <li>1. Communication English</li> <li>2. Applied Mathematics-I</li> <li>3. Engineering Physics-I</li> <li>4. Engineering Chemistry-I</li> <li>5. Computer Application Lab</li> <li>6. Workshop Practice Lab</li> </ol> <p><b>IInd Sem</b></p> <ol style="list-style-type: none"> <li>1. Applied Mathematics-II</li> <li>2. Engineering Physics-II</li> <li>3. Engineering Chemistry-II</li> <li>4. Engineering Graphics</li> <li>5. Engineering Physics-II Lab</li> <li>6. Engineering Chemistry-II Lab</li> </ol> <p><b>IIIrd Sem</b></p> <ol style="list-style-type: none"> <li>1. Engineering Mechanics-I</li> <li>2. Electronic Devices</li> <li>3. Circuit Theory</li> <li>4. Electrical Machines-I</li> <li>5. Electronic Devices Lab</li> <li>6. Electrical Machines-I Lab</li> </ol> <p><b>IVth Sem</b></p> <ol style="list-style-type: none"> <li>1. Linear and Digital ICs</li> <li>2. Computer Hardware and Networking</li> <li>3. Electrical Machines-II</li> <li>4. Measurements and Instruments</li> <li>5. IC Lab</li> <li>6. Electrical Machines –II Lab</li> </ol> <p><b>Vth Sem</b></p> <ol style="list-style-type: none"> <li>1. Power Systems I</li> </ol>



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2. Microprocessor and Microcontrollers
3. Electrical Machine Design
4. Control of Electrical Machines
5. Control of Electrical Machines Lab
6. Microcontrollers Lab
7. Principles of Management

### Vth Sem

1. Power Systems II
2. Power Electronics
3. Electrical Estimation
4. Power Electronics Lab
5. Project
6. Marketing Management



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## Syllabus: Diploma in Electrical Engineering

### SYLLABUS

#### SEMESTER : I

#### SUBJECT: COMMUNICATION ENGLISH

##### **BLOCK 1      Grammar (Non-Textual)**

Unit 1: Functional Analysis

Unit 2: Voice and parts of speech

Unit 3: Direct and indirect speech

Unit 4: Preposition

##### **BLOCK 2      Grammar**

Unit 1: One word substitute

Unit 2: Articles and question tags

Unit 3: Prefixes and suffixes

Unit 4: Tenses

##### **BLOCK 3      Compositions**

Unit 1: Comprehension

Unit 2: Simple passage

Unit 3: Moral story

Unit 4: Science and technology



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## Syllabus: Diploma in Electrical Engineering

### **BLOCK 4 Letter and dialogue Writing**

Unit 1: Letter writing - personal

Unit 2: Letter writing - official

Unit 3: Dialogue writing

Unit 4: Hints development

### **BLOCK 5 Proses**

Unit 1: An Astrologer's day – R.K. Narayanan

Unit 2: The sun, The planets and the stars – C.Jones

Unit 3: The continuing spell of Ramanujam

Unit 4: On saying 'please' – A.G.Gardiner

## **SUBJECT : Applied Mathematics-I**

### **BLOCK 1 Algebra**

Unit 1: Determinants

Unit 2: Matrices

Unit 3: Permutation and combination

Unit 4: Binomial Theorem

### **BLOCK 2 Complex numbers**



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Unit 1: Real and imaginary parts

Unit 2: Demoivre's Theorem

Unit 3: Finding the  $n^{\text{th}}$  roots of unity

Unit 4: Solving equations

### **BLOCK 3     Analytical geometry**

Unit 1: Pair of straight lines

Unit 2: Circles

Unit 3: Family of circles

Unit 4: Concentric circles

### **BLOCK 4     Trigonometry**

Unit 1: Compound angles

Unit 2: Multiple angles

Unit 3: Sub multiple angles

Unit 4: Sum and product formulae

### **BLOCK 5     Differential calculus**

Unit 1: Limits

Unit 2: Differentiation

Unit 3: Differentiation methods

Unit 4: Successive differentiation



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### SUBJECT: Engineering Physics – I

#### **BLOCK 1      S I units and Statics**

Unit 1: Fundamental quantities

Unit 2: Derived quantities

Unit 3: Concurrent forces

Unit 4: parallelogram Law of forces

#### **BLOCK 2      Properties of matter**

Unit 1: Stress and strain

Unit 2: Young's modulus

Unit 3: Viscosity

Unit 4: Surface Tension

#### **BLOCK 3      Dynamics**

Unit 1: Projectile Motion

Unit 2: Angle of projection

Unit 3: Circular Motion

Unit 4: Application of circular motion

#### **BLOCK 4      Rotational motion of rigidity bodies**



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## Syllabus: Diploma in Electrical Engineering

Unit 1: Moment of Inertia

Unit 2: Kinetic energy

Unit 3: Angular Momentum

Unit 4: Kepler's Law

### **BLOCK 5 Remote sensing and sound**

Unit 1: Active and Passive remote sensing

Unit 2: Microwave remote sensing

Unit 3: Types of sound waves

Unit 4: Acoustics

## **SUBJECT: Engineering Chemistry - I**

### **BLOCK 1 Acids – Bases, Catalysis**

Unit 1: Theories of Acids and Bases

Unit 2: Industrial application

Unit 3: Positive and Negative catalyst

Unit 4: Characteristics of Catalyst

### **BLOCK 2 Pollution**

Unit 1: Air Pollution

Unit 2: Global warming

Unit 3: Water Pollution



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## Syllabus: Diploma in Electrical Engineering

Unit 4: Green Chemistry

### **BLOCK 3      Electro chemistry and corrosion**

Unit 1: Types of conductors

Unit 2: Industrial applications of Electrochemistry

Unit 3: Electrochemical theory

Unit 4: Electroplating

### **BLOCK 4      Organic coatings**

Unit 1: Paint

Unit 2: Varnish

Unit 3: Adhesives

Unit 4: Lubricants

### **BLOCK 5      Colloids and Ceramics**

Unit 1: Colloidal solution

Unit 2: Brownian Movement

Unit 3: Water purification

Unit 4: Ceramics

## **SUBJECT: Computer Application Lab**

**Practicals**





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### Windows

- 1.a. Starting a program, running a program.
- b. Starting the Windows in safe mode
- c. Running multiple Programs and switching between windows.
- d. Moving the windows, and the task bar.
- e. Startup to MS-DOS prompt.
- 2.a. Creating and removing a folder.
- b. Making the taskbar wider, arranging icons on the Desktop.
- c. Displaying and hiding the taskbar clock.
- d. Controlling the size of start menu options.
- e. Creating shortcuts.
- 3.a. Installing a screen saver.
- b. Assigning Wallpaper to Desktop.
- c. Adding a program to the start menu.
- d. Recovering files and folders from Recycle bin.
- e. Customizing the mouse settings.
- 4 a. Expanding and collapsing a folder.
- b. Recognizing file types using icons.
- c. Running a program from explorer.



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- d. Renaming a file or folder.
- e. Selecting two or more files for an operation.
- 5.a. Displaying the properties for a file or folder.
- b. Using cut and paste operations to copy a file.
- c. Using copy and paste operations to copy a file.
- d. Moving and copying files with mouse.
- e. Sorting a folder.
- 6.a. Finding a file or folder, by name.
- b. Defragmenting the disk using disk defragmenter.
- c. Compressing a file using WinZip.
- d. Controlling the speaker volume.
- e. Recording and saving an audio file.

### MS Word

- a. Prepare a newsletter with borders, two columns text, header and footer and a graphic image and spell check the document.
- b. Create a table to show the paradigm of the verb “eat” in all 12 tenses



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Tense		Present	Past	Future
Simple	He	Eats	Ate	Will eat
	I	Eat	Ate	Will eat
	You/They	Eat	Ate	Will eat
Continuous	He	Is eating	Was eating	Will be eating
	I	Am eating	Was eating	Will be eating
	You/They	Are eating	Was eating	Will be eating
Perfect	He	Has eaten	Had eaten	Will have eaten
	I	Have eaten	Had eaten	Will have eaten
	You/They	Have eaten	Had eaten	Will have eaten
Perfect continuous	He	Has been eating	Had been eating	Will have been eating
	I	Have been eating	Had been eating	Will have been eating
	You/They	Have been eating	Had been eating	Will have been eating

c. Prepare your Bio-data/Resume

d. Do the mail merge operation for sending applications to many companies with your resume

### MS EXCEL

1. Create a worksheet in Excel for a company:

a. Copy, Move and Merge the cells

b. Adding Comments

c. Adding, Deleting the cells, Rows and Columns

d. Hiding and Unhiding the columns, Rows and gridlines.

2. Using formula and functions prepare worksheet for storing subject marks of ten students

and perform the following:



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- a. Calculate the student wise total and average
  - b. Calculate the subject wise total and average
  - c. Calculate the overall percentage and also individual percentage of the student.
3. Create Bar Graph and Pie Chart for various data

### MS Power Point

- a. Create a simple presentation with atleast 5 slides to introduce your friend and include sounds in slides.
- b. Create a presentation with 5 slides for the essay Astrologer's Day by R.K Narayanan

### Internet

- a. Creating an E-Mail account.
- b. Sending an E-Mail to a known Address
- c. Viewing an E-Mail received from your friend/relative.
- d. Printing an E-Mail received
- e. Use of Attachment Facility
- f. Use of Address Book Facility
- g. Use of Sent Folder
- h. Use of Save Draft Folder
- i. Use of Trash Folder
- j. Browse a given web-site address.



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k. Search a Particular topic through a Search engine.

### **SUBJECT: Workshop Practice lab I**

#### **Fitting**

1. Fittion
2. V - Joint
3. L - Joint
4. T - Joint
5. Half round joint
6. Dovetail Joint
7. U – Joint
8. Hexagonal – Joint
9. Step - Joint
10. Drilling and Tapping M8
11. Drilling and Tapping M10

#### **Wiring**

1. Single lamp controlled by single switch.
2. Two Lamps controlled by Two independent switches.
3. Stair case Wiring
4. Fluorescent lamp circuit.
5. Circuit diagram of a fan
6. Circuit diagram of an iron box



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7. Circuit diagram of a mixie
8. Soldering practice

### Sheet Metal

1. Hemming
2. Seaming
3. Tray
4. Cylinder
5. Cone
6. Hopper
7. Dust Pan
8. Funnel

## SEMESTER : II

### SUBJECT: Applied Mathematics - II

#### BLOCK 1 Vector Algebra

Unit 1: Introduction

Unit 2: Vector Properties

Unit 3: Product of Vectors

Unit 4: Application of Vectors



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## Syllabus: Diploma in Electrical Engineering

### **BLOCK 2      Integral Calculus**

Unit 1: Integration

Unit 2: Standard Integrals

Unit 3: Integration by parts

Unit 4: Bernoulli's Theorem and Applications

### **BLOCK 3      Differentiation**

Unit 1: Velocity and Acceleration

Unit 2: Tangents and Normals

Unit 3: Maxima and Minima

Unit 4: Partial differentiation

### **BLOCK 4      Application of Integration**

Unit 1: Definite Integral.

Unit 2: Area and Volume

Unit 3: Solution of differential equations

Unit 4: Second order differential equation with constant coefficients

### **BLOCK 5      Probability Distributions**

Unit 1: Continuous random variable

Unit 2: Discrete random variable

Unit 3: Discrete Distributions (Binomial, Poisson )



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## Syllabus: Diploma in Electrical Engineering

Unit 4: Continuous Distribution

### **SUBJECT: Applied Mathematics – II**

#### **BLOCK 1      Vector Algebra**

Unit 1: Introduction

Unit 2: Vector Properties

Unit 3: Product of Vectors

Unit 4: Application of Vectors

#### **BLOCK 2      Integral Calculus**

Unit 1: Integration

Unit 2: Standard Integrals

Unit 3: Integration by parts

Unit 4: Bernoulli's Theorem and Applications

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## Syllabus: Diploma in Electrical Engineering

Unit 1: Definite Integral.

Unit 2: Area and Volume

Unit 3: Solution of differential equations

Unit 4: Second order differential equation with constant coefficients

### **BLOCK 5      Probability Distributions**

Unit 1: Continuous random variable

Unit 2: Discrete random variable

Unit 3: Discrete Distributions (Binomial, Poisson )

Unit 4: Continuous Distribution

## **SUBJECT: Engineering Physics – II**

### **BLOCK 1      Heat**

Unit 1: Heat - Kinetic Theory of Gases:

Unit 2: Specific Heat

Unit 3: Isothermal Changes

Unit 4: Adiabatic Changes

### **BLOCK 2      Gases & Non Conversional Energy**

Unit 1: Liquefaction of Gases

Unit 2: Joule Thomson Effect & Linde's process



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Unit 3: Renewable and Non-renewable sources

Unit 4: Alternate sources of Energy-

### **BLOCK 3      Light & Magnetism**

Unit 1: Optical Instruments

Unit 2: Lasers

Unit 3: Basic definitions of Magnetism

Unit 4: Hysteresis Loop

### **BLOCK 4      Electricity**

Unit 1: Basic laws

Unit 2: Force on a moving charge

Unit 3: Measuring Instruments

Unit 4: Heating Effect of Electric Current

### **BLOCK 5      Dielectric effect & Electronics**

Unit 1: Chemical Effect of Electric Current

Unit 2: Capacitor

Unit 3: Semiconductors , PN Junction & Transistors

Unit 4: Logic Gates



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### SUBJECT: Engineering Chemistry – II

#### **BLOCK 1      Nuclear Chemistry**

- Unit 1: Radio activity and definitions
- Unit 2: Half life period & Nuclear fission & fusion
- Unit 3: Applications of radio active isotopes
- Unit 4: Abrasives

#### **BLOCK 2      Fuels and Refractories**

- Unit 1: Fuels - classification
- Unit 2: Solid and Liquid Fuels
- Unit 3: Gas Fuels
- Unit 4: Refractories

#### **BLOCK 3      Water Treatment**

- Unit 1: Water Treatment Methods
- Unit 2: EDTA Method
- Unit 3: Water -purification
- Unit 4: Lime and manufacturing process

#### **BLOCK 4      Plastics and Rubber**

- Unit 1: Thermoplastics,



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Unit 2: Thermo set plastics

Unit 3: Natural rubber-

Unit 4: Synthetic rubber

### **BLOCK 5 Metallurgy**

Unit 1: Tungsten & Titanium

Unit 2: Powder metallurgy

Unit 3: Purpose of alloying

Unit 4: Non ferrous alloys

## **SUBJECT: Engineering Graphics**

### **BLOCK 1 Drawing Office Practice**

Unit 1: Basics of Engg Drawing

Unit 2: Dimensioning

Unit 3: Scales

Unit 4: Geometrical Constructions, conics and geometrical curves

### **BLOCK 2 Projection**

Unit 1: Orthographic Projection

Unit 2: Projection of simple solids

Unit 3: Section of Solids



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## Syllabus: Diploma in Electrical Engineering

Unit 4: Half & Full Sectioning

### **BLOCK 3 Pictorial drawings**

Unit 1: Introduction

Unit 2: Isometric Drawings

Unit 3: Conversion of orthographic views

### **BLOCK 4 Development of Surfaces:**

Unit 1: Cube, Cylinder

Unit 2: Prism

Unit 3: Pyramids

Unit 4: Tee and Elbow

### **BLOCK 5 AutoCAD**

Unit 1: Introduction

Unit 2: AutoCAD commands

Unit 3: Drawing -line, circle, arc, polygon,

Unit 4: Drawing - ellipse, rectangle



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### SUBJECT: Engineering Physics Lab

#### List of Experiments

- 1 VERNIER CALIPERS - To find the volumes of the solid cylinder and hollow cylinder using vernier callipers.
  
- 2 SCREW GAUGE – To find the thickness of (a) glass plate (b) given sphere using screw gauge. Hence calculate the volume of the glass plate and the sphere.
  
- 3 SIMPLE PENDULUM – To find the acceleration due to gravity in the laboratory, using simple pendulum. Calculate the acceleration due to gravity, by  $L-T^2$  graph.
  
- 4 CONCURRENT FORCES -To verify the parallelogram law of forces and Lami's theorem.
  
- 5 COPLANAR – PARALLEL FORCES – To verify the conditions of the Co-planar parallel forces.
  
- 6 TORSION PENDULUM – To find the rigidity modulus of the thin wire and moment of inertia of the disc by using symmetric masses.
  
- 7 COMPARISON OF VISCOSITIES – To compare the coefficient of viscosities of two liquids by capillary flow method.



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8 VISCOSITY OF A HIGHLY VISCOUS LIQUID – To find the coefficient of viscosity of a highly viscous liquid.

9 SURFACE TENSION: To find the surface tension of the given liquid by capillary rise method

10 YOUNG'S MODULUS – To find the young's modulus of the material of the given metre scale.

11 SPECTROMETER – 1. To find the angle of the prism.

12 SPECTROMETER – 2. To find the refractive index of the material of the prism.

13 DEFLECTION MAGNETOMETER – To compare the magnetic moments of two given magnets by (a) Equal distance method and (b) Null method.

14 SONO METER – To find the frequency of the given tuning fork.

15 JOULE'S CALORIMETER – To determine the specific heat capacity of the given liquid.

16 COPPER VOLTAMETER – To determine electro – chemical – equivalent of copper.



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17 OHM'S LAW – To determine the resistance of two given coils of wire using Ohm's law. Also verify the laws of resistances.

18 POTENTIO METER – To compare the e.m.fs of two given cells.

19 PN JUNCTION DIODE – For the given semiconductor diode draw (a) Forward bias (b) Reverse bias characteristic curves.

20 SOLAR CELLS – V. I. Characteristics.

## SUBJECT: Applied Chemistry Lab

### List of Experiments

#### 1. Qualitative Analysis

**Acid radicals** : Chloride, Carbonate, Sulphate, Nitrate

**Basic radicals**: Lead, Cadmium, Copper, Aluminium, Zinc, Calcium, Magnesium, Ammonium

Identification of acid and basic radicals in

1. Lime Stone (Calcium Carbonate)

2. Pollutant (Lead nitrate or Cadmium Carbonate)





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3. Fertilizer(Ammonium sulphate)

4. Electrolyte(Ammonium Chloride)

5. Fungicide(Copper sulphate)

6. Coagulant(Aluminium Sulphate)

7. Mordant(Zinc Sulphate)

8. Gypsum(Calcium Sulphate)

9. Epsom(Magnesium Sulphate)

10. Analysis of an Effluent (containing pollutants like Lead, Cadmium, Zinc, Copper).Students may be given above four pollutants , in four separate test tubes in solution form and asked to report metallic pollutants with procedure (Basic Radical Analysis Procedure) and their harmful effects.

## 2. VOLUMETRIC ANALYSIS (DOUBLE TITRATIONS)

### ACIDIMETRY AND ALKALIMETRY

1. Estimation of Hydrochloric acid

2. Estimation of Sodium Hydroxide

3. Estimation of Sodium Carbonate

4. Comparison of Strengths of two bases

### PERMANGANIMETRY



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5. Estimation of Ferrous Ammonium Sulphate

6. Estimation of Ferrous Sulphate

7. Comparison of Potassium Permanganate.

### WATER ANALYSIS

8. Estimation of Total Hardness by EDTA method.

9. Calculation of pH of four sample solutions and calculation of H<sup>+</sup> Ion concentration for a particular sample solution.

## SEMESTER : III

### SUBJECT: Engineering Mechanics-I

#### BLOCK 1 Mechanical Properties of Materials

Unit 1: Basic Definitions

Unit 2: Stress

Unit 3: Strain

Unit 4: Stress-Strain Calculations

#### BLOCK 2 Geometrical Properties of Sections

Unit 1: Basic Definitions

Unit 2: Moment of Inertia

Unit 3: Thin cylinders

Unit 4: Thin Spherical Shells



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### **BLOCK 3      Theory of Simple Bending**

Unit 1: Shear Force

Unit 2: Bending Moment

Unit 3: Cantilever

Unit 4: Simple Bending

### **BLOCK 4      Torsion and Springs**

Unit 1: Theory of Torsion

Unit 2: Torsional Rigidity

Unit 3: Hollow Shaft

Unit 4: Springs

### **BLOCK 5      Deflections**

Unit 1: Beams

Unit 2: Friction

Unit 3: Gear Drives

Unit 4: Belt Drives

### **Books :**

1. Applied Mechanics by A.K. Upadhyay, Charotar Publishers



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2.Strength of Materials by R.S.Khurmi, S.Chand & Co

### **SUBJECT: Electronic Devices**

#### **BLOCK 1      Components and Diodes**

Unit 1: Resistor

Unit 2: Diode

Unit 3: Rectifiers

Unit 4: Filters

#### **BLOCK 2      Bipolar Junction Transistors**

Unit 1: Transistor Biasing

Unit 2: Transistor Configuration

Unit 3: RC Coupled Amplifier

Unit 4: Feedback Amplifiers

#### **BLOCK 3      Transistor Oscillators and FET, UJT**

Unit 1: Oscillator

Unit 2: FET

Unit 3: FET Amplifiers and choppers

Unit 4: UJT



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### **BLOCK 4 Thyristors**

Unit 1: SCR

Unit 2: DIAC

Unit 3: TRIAC

Unit 4: MOSFET and IGBT

### **BLOCK 5 Opto Electronic Devices and Wave shaping Circuits**

Unit 1: LDR, LED and LCD

Unit 2: Opto Coupler, Interrupter

Unit 3: Clipping and Clamping Circuits

Unit 4: Multivibrators

## **SUBJECT: Circuit Theory**

### **BLOCK 1 DC Circuits**

Unit 1: Electro Statics

Unit 2: Basic Laws

Unit 3: Series Circuits

Unit 4: Parallel Circuits

Unit 5: Problems in Series and Parallel Circuits



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### **BLOCK 2      Network Theorems**

Unit 1: Node voltage Analysis

Unit 2: Mesh Current Analysis

Unit 3: Star Delta Transformations

Unit 4: Thevenins and Norton Theorems

Unit 5: Superposition and Maximum Power Transform Theorem

### **BLOCK 3      Single Phase AC Circuits**

Unit 1: Basic Definitions

Unit 2: Resistor, Capacitor and Inductor in AC Circuits

Unit 3: RL and RC Circuits

Unit 4: Series RLC Circuits

Unit 5: Parallel RLC Circuits

### **BLOCK 4      Three Phase AC Circuits**

Unit 1: Star Delta Connections

Unit 2: Balanced Load and Unbalanced Load in Three Phase Circuits

Unit 3: Measurements of Three Phase Power

Unit 4: Effects of unbalanced Load

Unit 5: Problems in Three Phase Circuits



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## Syllabus: Diploma in Electrical Engineering

### **BLOCK 5      DC Transients**

Unit 1: Basics of Transients

Unit 2: Transients in RL

Unit 3: Transients in RC

Unit 4: Transients in RLC

Unit 5: Problems

### **Books :**

1. Electric Circuit Theory By Dr M. Arumugam, Dr N. Premkumar, Khanna Publishers
2. Electric Circuits By Joseph Edminister, Schaum Series

## **SUBJECT: Electrical Machines -I**

### **BLOCK 1      Electromagnetism**

Unit 1: Basic Laws

Unit 2: Storage Elements

Unit 3: Self Inductance

Unit 4: Mutual Inductance

### **BLOCK 2      Transformers**

Unit 1: Principle of working

Unit 2: Phase Diagram

Unit 3: Losses and Efficiency



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## Syllabus: Diploma in Electrical Engineering

Unit 4: Three Phase Transformer

### **BLOCK 3      DC Generators**

Unit 1: Principle of working

Unit 2: Load Characteristics

Unit 3: Losses and Efficiency

Unit 4: Applications of DC Generators

### **BLOCK 4      DC Motor**

Unit 1: Principle of working

Unit 2: Load Characteristics

Unit 3: Losses and Efficiency

Unit 4: Speed Control and Applications of DC Motors

### **BLOCK 5      Maintenance of Machines**

Unit 1: Sparking

Unit 2: Growler

Unit 3: Protective Devices

Unit 4: Fundamental Rules for Maintenance

### **Books :**

1.A Course in Electrical Engg (Vol II) By BL Theraja, S.Chnad Publishers





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## Syllabus: Diploma in Electrical Engineering

2. Electrical Technology By JB Gupta, S.K. Kataria & Sons

### **SUBJECT: ELECTRONIC DEVICES Lab**

#### **LIST OF EXPERIMENTS**

1. VI Characteristics of PN JN Diode
2. VI Characteristics of Zener diode.
3. HW, FW with and without filter.
4. Bridge Rectifier with and without filters.
5. VI characteristics of Regulator.
6. Input/output characteristics of CE Transistor.
7. Frequency response of RC coupled amplifier.
8. Emitter follower.
9. Negative feedback amplifier.
10. RC phase shift oscillator.
11. Hartley and Colpitts oscillator.
12. JFET characteristics.



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## Syllabus: Diploma in Electrical Engineering

13. Common source amplifier.
14. UJT characteristics.
15. UJT relaxation oscillator.
16. SCR characteristics.
17. DIAC and TRIAC characteristics.
18. Clipper, clamper and voltage doubler.
19. LDR, Photo diode and Photo transistor characteristics.
20. Solar cell and opto coupler.

## **SUBJECT: Electrical Machines-I Lab**

### **LIST OF EXPERIMENTS**

1. Verification of Ohm's Law
2. Verification of Kirchoff's Voltage and current Law
3. Verification of Superposition theorem
4. Verification of Thevenin's theorem
5. Verification of Norton's Theorem
6. Verification of maximum Power transfer theorem
7. To Conduct OC and SC test to determine the efficiency of transformer



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## Syllabus: Diploma in Electrical Engineering

8. To Calibrate of ammeter and Voltmeter
9. To Construct and test the performance of Wheatstone bridge
10. To Construct and test the performance of Wien bridge
11. To Construct RLC bridge to measure R , L and C
12. To measure the amplitude and frequency using dual trace CRO
13. To measure frequency and phase angle using CRO by Lissajous Figure
14. To Construct and test the performance of photoelectric transducer
15. To measure displacement using LVDT
16. To measure the strain using load cell
17. To measure the strain using strain gauge
18. To measure the temperature using thermistor

## SEMESTER : IV

### SUBJECT: LINEAR and DIGITAL ICs

#### BLOCK 1 Linear IC

Unit 1: OP Amp

Unit 2: Timer Circuits

Unit 3: Multivibrators



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## Syllabus: Diploma in Electrical Engineering

Unit 4: Voltage Regulators

### **BLOCK 2 Boolean algebra**

Unit 1: Number Systems

Unit 2: Basic Laws and Theorems

Unit 3: Basic Logic Gates

Unit 4: Karnaugh Maps

### **BLOCK 3 Combinational logic**

Unit 1: Arithmetic Circuits

Unit 2: Adders

Unit 3: Encoders and Decoders

Unit 4: IC Families (TTL, CMOS, LS)

### **BLOCK 4 Sequential logic**

Unit 1: Flip Flops

Unit 2: Counters

Unit 3: State Diagram

Unit 4: Shift Registers

### **BLOCK 5 D/A, A/D and Memory**

Unit 1: D/A Converter



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## Syllabus: Diploma in Electrical Engineering

Unit 2: R-2R ladder Network

Unit 3: A/D Converters

Unit 4: Memories

## SUBJECT: Computer Hardware and Networking

### **BLOCK 1 Mainboards and Processors**

Unit 1: Introduction to Computers

Unit 2: Mainboard and Chipsets

Unit 3: Interface Bus Standards

Unit 4: Processors

### **BLOCK 2 Peripherals**

Unit 1: Input Devices

Unit 2: Output Devices

Unit 3: Storage Devices (HDD)

Unit 4: Removable Storage Devices (CD/DVD, FDD)

### **BLOCK 3 I/O Ports and External Peripherals**

Unit 1: Video Capture and Sound Card

Unit 2: Serial and Parallel Ports and Power Supply Unit



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## Syllabus: Diploma in Electrical Engineering

Unit 3: Modem, Digital Cameras

Unit 4: Printer and Scanners

### **BLOCK 4      PC assembling and testing**

Unit 1: PC assembly

Unit 2: CMOS Setup

Unit 3: POST

Unit 4: Diagnostic Software and Anti Virus

### **BLOCK 5      Computer Network and Installation**

Unit 1: Network Basics

Unit 2: LAN

Unit 3: Media and Hardware

Unit 4: Network Administration

## **SUBJECT: Electrical Machines-II**

### **BLOCK 1      Introduction to OOPs**

Unit 1: Limitation of Procedural Languages

Unit 2: Object Oriented approach

Unit 3: Analogy; Approach to Organisation

Unit 4: characteristics of Object Oriented Languages



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## Syllabus: Diploma in Electrical Engineering

### **BLOCK 2      Encapsulation**

Unit 1: Introduction

Unit 2: Types of Encapsulation

Unit 3: Objects

Unit 4: Classes

### **BLOCK 3      Data abstraction**

Unit 1: Introduction

Unit 2: Types of Data Abstraction

Unit 3: Binding

Unit 4: Types of Binding

### **BLOCK 4      Inheritance**

Unit 1: Introduction

Unit 2: Types of Inheritance

Unit 3: Characteristics

Unit 4: Programs

### **BLOCK 5      Polymorphism**

Unit 1: Introduction

Unit 2: Types of Polymorphism

Unit 3: Over Loading



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## Syllabus: Diploma in Electrical Engineering

Unit 4: Application of OOPS

### **SUBJECT: Measurements and Instruments**

#### **BLOCK 1      Classifications of Instruments**

Unit 1: Basic Definitions

Unit 2: Indicating Instruments

Unit 3: Integrating Instruments

Unit 4: Control Mechanism of Instruments

#### **BLOCK 2      Measurements of Electrical Quantities**

Unit 1: Construction and working Principles of meters

Unit 2: Induction type meters

Unit 3: Earth Testers

Unit 4: CRO

#### **BLOCK 3      Measurement of Power and energy**

Unit 1: Types of Watt Meters

Unit 2: 2 Watt Meter Method

Unit 3: Energy Meter

Unit 4: Calibration of meters

#### **BLOCK 4      Special Instruments**





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## Syllabus: Diploma in Electrical Engineering

Unit 1: MD Indicator

Unit 2: Synchroscope

Unit 3: Frequency Meter

Unit 4: Recorders

### **BLOCK 5     Transducers**

Unit 1: Electrical Transducers

Unit 2: LVDT

Unit 3: Piezo Electric sensors

Unit 4: Proximity sensors

### **Books :**

- 1.A course in Electrical and Electronics Measurements and Instrumentation by A.K. Sawhney, Dhanpat Rai Publishers
- 2.Electronic Instrumentation by H.S. Kalsi, TataMcHill Publishers

## **SUBJECT: IC Lab**

### **LIST EXPERIMENTS**

1. Construct and test a) Inverting Amplifier and b) Non inverting amplifier using Op- --Amp.
2. Construct and test a) Scale changer circuit b) Summer circuit using Op.Amp.
3. Construct and test a) Differentiator circuit b) Integrator circuit using Op. Amp.
4. Construct and test a) Astable Multivibrator using IC 555 and test its performance.



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## Syllabus: Diploma in Electrical Engineering

5. Construct and test a Monostable Multivibrator using IC 555 and test its performance.
6. Verify the truth table for the following gates AND, OR, NOT, NAND, NOR, EX-OR USING 74XX Ics.
7. Construct other gates using NAND gates.
8. Construct a Half Adder using 7408, 7432, 7486, Ics and verify its truth table.
9. Construct Full Adder and verify the truth table using 74XX Ics.
10. Construct Half Subtractor and verify its truth table using 74XX Ics.
11. Construct Full Subtractor and verify its truth table using 74XX Ics.
12. Construct and verify the truth table of RS,D and JK FFs.
13. Construct a 4 bit BCD counter using 7473 Ics and observe the output waveform.
14. Construct a Decade counter using 7473 Ics and observe the output waveform.
15. Construct and verify the performance of a 1 digit counter using 7490, 7447, 7475 and seven segment LEDs.
16. Construct a 4 bit weighted Resistor D/A converter and test its performance.
17. Construct a 4 bit r-2R Ladder D/A converter and test its performance.
18. Verify the operation of ADC.

## **SUBJECT: Electrical Machines – II Lab**

### **Structure of the Course Content**

1. Predetermination of regulation of alternator by synchronous impedance method.



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## Syllabus: Diploma in Electrical Engineering

2. Load Test on single Phase alternator.
3. Load Test on three Phase Alternator.
4. Synchronising of two alternators by lamp & synchroscope method.
5. Determination of 'V' Curve and inverted 'V' curves of a three phase synchronous motor.
6. Conduct load test on a single phase induction motor and plot
  - a. Load Vs efficiency
  - b. Load Vs Powerfactor
  - c. Torque Vs Slip characteristic curves.
7. Conduct load test on three phase induction motor and plot
  - a. Load Vs Efficiency
  - b. Load Vs P.f.
  - c. Torque Vs Slip characteristic curves.
8. Conduct load test on 3 phase slipping Induction motor and plot
  - a) Output Vs efficiency
  - b) Output Vs Torque
  - c) Output Vs slip Characteristics.
  - d) Output Vs Line Current
  - e) Output Vs P.F



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## Syllabus: Diploma in Electrical Engineering

9. Draw the equivalent circuit of a 3 phase Induction motor by conducting No load and Blocked rotor test.
10. Draw the circle diagram for 3 phases Induction Motor by conducting suitable Tests.

## SEMESTER - V

### SUBJECT: Power Systems I

#### **BLOCK 1      Generation and Conservation of Electrical Power**

- Unit 1: Conventional methods of power generations
- Unit 2: Economics of power factor improvement
- Unit 3: Introduction to energy conservation
- Unit 4: Principles of energy audit and Energy Management

#### **BLOCK 2      Transmission (AC and Heavy DC)**

- Unit 1: Typical lay out of AC power supply scheme
- Unit 2: Over Head lines
- Unit 3: Effect of load and power factor on regulation and efficiency
- Unit 4: High voltage DC transmission

#### **BLOCK 3      Insulators (OH Line and UG Cable Lines)**



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## Syllabus: Diploma in Electrical Engineering

Unit 1: Types of line insulators

Unit 2: Corona

Unit 3: Various parts of a three conductor UG cable

Unit 4: Cable Faults

### **BLOCK 4     Protective Elements**

Unit 1: Circuit Breakers

Unit 2: Classification of Circuit Breakers

Unit 3: DC breaking

Unit 4: Fuses

### **BLOCK 5     Relays and Earthing**

Unit 1: Protective relay

Unit 2: Functional relay types

Unit 3: Static relay

Unit 4: Grounding

### **Books :**

1. Principles of Power Systems by VK Metha, S.Chand Publishers  
Electrical Power System Planning by AS Pabla, McMillan Publishers



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## Syllabus: Diploma in Electrical Engineering

### **SUBJECT: Microprocessor and Microcontrollers**

#### **BLOCK 1      8085MPU and Applications**

- Unit 1: Evolution of Microprocessors and 8085 Architecture
- Unit 2: Instruction format & set and Addressing Modes
- Unit 3: Simple Programs and Branching Instructions
- Unit 4: Interrupt Structure, Memory mapping and Status signals

#### **BLOCK 2      8051 Microcontroller**

- Unit 1: Architecture and Pin Configurations
- Unit 2: Timing and Clock
- Unit 3: Flags and Registers and SFR(s)
- Unit 4: Interrupts (External and Internal)

#### **BLOCK 3 Programming Concepts**

- Unit 1: Tool chain and Techniques
- Unit 2: Addressing Modes and Instructions
- Unit 3: Programs (Add, Sub Multiplication and Div)
- Unit 4: Programs (Sum, ascending, Descending, Largest and smallest of N numbers)

#### **BLOCK 4      Programming Concepts**

- Unit 1: Block and Signal Diagrams



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## Syllabus: Diploma in Electrical Engineering

Unit 2: Control word format

Unit 3: Peripheral Devices (8255,8254,8259,8279)

Unit 4: Serial and AD/DAC Interfacing

### **BLOCK 5      Applications**

Unit 1: I/O Interface (Keyboard and LCD)

Unit 2: Traffic Light Controller

Unit 3: Temp Controller, Freq and Period Measurement

Unit 4: Motor, Solenoids, relay Interfaces.

### **Books :**

1. Microprocessor and Microcontroller by R.Theagarajan, Sci tech Publications
2. The 8051 Microcontroller By Kenneth J Ayala, Penram Internationa Publication

## **SUBJECT: Electrical Machine Design**

### **BLOCK 1      Fundamental Principles**

Unit 1: Standards and Specifications of DC and AC machines

Unit 2: Design and Constructions

Unit 3: Materials used

Unit 4: Losses (Elect, Magnetic & Temp)



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## Syllabus: Diploma in Electrical Engineering

### **BLOCK 2      Magnetic Circuit Calculations**

Unit 1: Force Calculations

Unit 2: Force (in teeth, gap)

Unit 3: Flux and Reactance

Unit 4: Rotating machines

### **BLOCK 3      Transformer Design**

Unit 1: Core and Shell Types

Unit 2: Generation and Distribution transformer

Unit 3: Single and Multi Phase

Unit 4: Electric Loading and Winding design

### **BLOCK 4      DC machines Design**

Unit 1: Poles

Unit 2: Commutator and Thyristor supply

Unit 3: Electric Loading

Unit 4: Flowchart estimation for KW and Dimension

### **BLOCK 5      AC Machines Design**

Unit 1: Design Considerations and Power equations

Unit 2: Three Phase Motor design





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## Syllabus: Diploma in Electrical Engineering

Unit 3: Synchronous Motor

Unit 4: Rotor design

### Books :

1. Principles of electrical Machine Design, by SK Sen. Oxford & IBH Publishers
2. The performance and design of AC machines by MG Say, CBS publishers

## **SUBJECT: Control of Electrical Machines**

### **BLOCK 1 Control Circuit Components**

Unit 1: Switches

Unit 2: Relays

Unit 3: Solenoid

Unit 4: Timers

### **BLOCK 2 DC Motor Controls**

Unit 1: Current limiters, Starters

Unit 2: Acceleration & EMF Starters

Unit 3: Jogging , Braking, Reversing Control

Unit 4: UJT & SCR Speed Controls

### **BLOCK 3 AC Motor Control Circuits**

Unit 1: Motor Current and Starters

Unit 2: DOL and Auto Transformer Starters



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## Syllabus: Diploma in Electrical Engineering

Unit 3: Star/Delta Starter, Dynamic Braking

Unit 4: Secondary Frequency Acceleration Starters

### **BLOCK 4     PLCs**

Unit 1: Introduction and Advantages

Unit 2: PLC Operation and Programming

Unit 3: Ladder logic Diagram

Unit 4: PLC instructions and I/O Module & Scan

### **BLOCK 5     Transformer Maintenance**

Unit 1: Inspection and Installation

Unit 2: OIL Testing and Purification

Unit 3: Dismantling and Circuit test

Unit 4: Protection and Earthling

### **Books :**

1. Control of Electrical Machines by SK Bhattacharys, New Age International Publishers  
Operation and Maintenance of Electrical machines by BVS Rao, Khanna Publishers

## **SUBJECT: Control of Electrical Machines Lab**

### **Structure of the Course Content**

1. Perform breakdown test and determine the dielectric strength of transformer oil



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## Syllabus: Diploma in Electrical Engineering

2. Conduct acidity test on transformer oil
3. Test the timing characteristic of thermal overload relay
4. Wire and test the control circuit for jogging in cage motor
5. Wire and test the control circuit for semi-automatic star-delta starter
6. Wire and test the control circuit for automatic star-delta starter
7. Wire and test the control circuit for dynamic braking of cage motor
8. Wire and test the control circuit for two speed pole changing motor
9. Wire and test the control circuit for automatic Rotor resistance starter
10. Conduct test on speed control of DC motor using SCR
11. Test the working of single phase preventer
12. Wire and test the DOL starter using PLC
13. Wire and test the Star-Delta starter using PLC
14. Wire and test the control circuit for jogging, forward and reverse operations using PLC
15. Wire and test the single phase preventer using PLC
16. Testing of 25 KVA, 11 KV/400 V distribution transformer – voltage test  
continuity test and short circuit test
17. Dismantling and re-assembling of 25 KVA, 11KV/400 V distribution transformer

## **SUBJECT: Microcontroller Lab**

### **Structure of the Course Content**

1. Introduction of Microcontroller Kit
2. Addition, Subtraction
3. Multi-byte addition
4. Multiplication of two numbers



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## Syllabus: Diploma in Electrical Engineering

5. Finding the maximum value in an array
6. Arranging the given data in Ascending order
7. BCD to Hex conversion
8. Hex to BCD conversion
9. Hex to ASCII
10. ASCII to Binary
11. Square Root of a given data
12. Least Common Multiple
13. Greatest Common Divisor
14. Parity bit generation
15. Program using I/Os in port 1
16. Counter using timer
17. Program using interrupt
18. Digital I/O
19. Matrix keyboard
20. Seven segment displays
21. LCD Displays
22. Traffic light
23. 8 bit ADC and 8 bit DAC
24. STEPPER MOTOR CONTROL
25. DC motor control
26. Lift control
27. Sending data through serial port between controller kit
28. Printer Interfacing with Microcontroller kit



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## Syllabus: Diploma in Electrical Engineering

### SUBJECT: Principles of Management

#### BLOCK 1

**INTRODUCTION TO MANAGEMENT:-** What is Management; Management as science, an art and profession; Objectives; Functions; nature of management?

**ROLE OF A MANAGER:-** Role of a manager; Qualities of a Professional Manager; Tasks of a manager; Managing the technology and other resources

#### BLOCK 2

**PLANNING:-** Need for Planning; Types of Planning and the Elements of Planning.

**MANAGERIAL DECISION MAKING:-** Introduction; Definitions of Decision Making; Kinds of Decisions; Decisions making styles; Components of Decision Making; Decision Making Procedure; Approaches to Decision Making; Some Decision Making Strategies

#### BLOCK 3

**ORGANIZING:- Organizational Structure;** Organizational Design; Different Types of Organizational Design; Common Organizational Designs.

**CONTROLLING:-** Controlling Concepts; **Characteristics of the Control Process; Management Control Strategies; Designing Effective Control Systems**

#### BLOCK 4

**FEED BACK SYSTEM:- Dysfunctional Consequences of Control;** Feed forward control; Concurrent control; Feedback control; Steps in the Control Process

**STAFFING:-** Staffing; Human Resource Management; HR Planning; Recruitment; Recruitment Need; Selection

**MOTIVATION:-** Motivation and its Theories



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## Syllabus: Diploma in Electrical Engineering

### BOOKS AND REFERENCES:

1. Robbins & Judge; "Organisational Behaviour"; PHI 12<sup>th</sup> Edition.
2. Aswathappa; " Organisationsal Behaviour"; HPH Edition 2007.
3. Ramasamy; "Principles of Management"; HPH Edition 2008  
Hatch; "Organizational Theory"; Oxford University Press; 2<sup>nd</sup> Edition.

## SEMESTER - VI

### SUBJECT: Power Systems II

#### BLOCK 1      Distribution

Unit 1: Classification of Distribution Systems

Unit 2: Types of AC distributions

Unit 3: Sub Stations

Unit 4: Bus-Bar Systems

#### BLOCK 2      Industrial Drives

Unit 1: Introduction

Unit 2: Types of Drives

Unit 3: Performance Characteristics of Motor

Unit 4: Selection and Applications



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## Syllabus: Diploma in Electrical Engineering

### **BLOCK 3      Electrical Traction**

Unit 1: Traction Systems

Unit 2: Track Electrification System

Unit 3: Traction Mechanics

Unit 4: Traction Motors

### **BLOCK 4      Traction Control**

Unit 1: Principle of DC Traction Control

Unit 2: Various Methods of DC Traction

Unit 3: Thyristor Control & Bracking Systems

Unit 4: Illumination Methods

### **BLOCK 5      Electric Heating and Welding**

Unit 1: Electric Heating

Unit 2: Resistance ovens and Furnaces

Unit 3: Induction Furnaces

Unit 4: Welding

### **Books :**

1. A Course in Electrical Power by JB Gupths, Katson Publishing Co.



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## Syllabus: Diploma in Electrical Engineering

2. Electric Power by S. Uppal, Khanna Publishers.

### **SUBJECT: Power Electronics**

#### **BLOCK 1 Thyristor Family Trigger and Commutation Circuits**

Unit 1: SCR Working & Characteristics

Unit 2: IGBT & MOSFET Working & Characteristics

Unit 3: DIAC, TRIAC, SCRS, SUS LASCOR & GTO Study

Unit 4: Trigger and Commutation Circuits

#### **BLOCK 2 Phase Controlled Rectifier**

Unit 1: Classification Of rectifier and Characteristics

Unit 2: Waveform and Power Factors for Various Rectifiers

Unit 3: Three Phase Full and Half Wave Rectifiers

Unit 4: Protection Converter

#### **BLOCK 3 Choppers and Inverters**

Unit 1: Choppers and it's working

Unit 2: Types of Chopper





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## Syllabus: Diploma in Electrical Engineering

Unit 3: Inverters and it's working

Unit 4: Applications of Choppers and inverters

### **BLOCK 4      Control of DC Drives**

Unit 1: DC Motor Speed Equation and Current Control

Unit 2: Schemes of Excitations

Unit 3: DC-DC Converters using MOSFET, IGBT

Unit 4: Closed Loop Control

### **BLOCK 5      AC Drives**

Unit 1: Torque and Speed Characteristics of 3 Phase motor

Unit 2: Closed loop control

Unit 3: Cycloconverter

Unit 4: Cycloconverter working

### **Books :**

1. Power Electronics by MD Singh & KB Khanchandaniata Tata MC Hill
2. Fundamentals of Electrical Drives by GK Dubey, Narosa Publishing

## **SUBJECT: Electrical Estimation**

### **BLOCK 1      Electrical Symbols**

Unit 1: Main and Distribution fuse-board with switches



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## Syllabus: Diploma in Electrical Engineering

Unit 2: Junction of conductors

Unit 3: UG,OH Lines Proposed and Existing, Motors etc

Unit 4: Sockets, Fuses, Rewireable Fuses and Consumer Appliances (Viz Fan Heater)

### **BLOCK 2 Indian Electricity Rules**

Unit 1: Rule 28, 30,31

Unit 2: Rule 46,47,54

Unit 3: Rule 56,77,79

Unit 4: Rule 87,88

### **BLOCK 3 Specifications of Electrical Items**

Unit 1: Switches & Sockets and Switch Boards & Boxes

Unit 2: Circuit Breaker and Regulators

Unit 3: Heaters and UG Cables & Wires

Unit 4: Lamps, Meters, Motors, Alternators

### **BLOCK 4 Wiring**

Unit 1: Internal Wiring

Unit 2: Types and procedures of wiring

Unit 3: Earthing

Unit 4: Testing and Installation



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## Syllabus: Diploma in Electrical Engineering

### **BLOCK 5      Domestic, Commercial and Industrial Installation**

Unit 1: Conditions and Requirements

Unit 2: Steps in electrical estimate

Unit 3: Estimate the quantity of material required for various types buildings

Unit 4: Street Light

#### **Books :**

1. Electrical Wiring, Estimating and Costing By Dr.S.L.Uppal, Khanna Publishers.  
Electrical Design Estimating and Costing By K.B.Raina & S.K.Battacharya. New age international Publishers

## **SUBJECT: Power Electronics Lab**

### **Structure of the Course Content**

1. Get the knowledge about the trigger circuit
2. Draw the input/output waveform using HCB and FCB
3. Know the performance of lamp control using DIAC-TRIAC
4. Learn the various techniques used for turn-off of Thyristor
5. Draw the waveform of series/parallel inverter
6. Draw the output waveform of DC chopper
7. Measure the output voltage of chopper
8. Find the performance of speed control of universal motor
9. Understand the concept of Closed loop control of AC motor



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## Syllabus: Diploma in Electrical Engineering

10. Know the performance of speed control of DC motor by varying firing angle
11. Understand the concept of Closed loop control of DC motor
12. Draw the output waveform of DC chopper using MOSFET/IGBT
13. Measure the variable output voltage using PWM technique

## SUBJECT: MARKETING MANAGEMENT

### BLOCK 1

**INTRODUCTION TO MARKETING:-** Origin, Definitions and Evolution of Marketing, Concepts of Marketing - Traditional and Modern Concepts of Marketing, Distinction between Market and Marketing, Distinction between Marketing and Selling, Scope and Importance of Marketing.

**MARKETING ENVIRONMENT:-** Concept, Forces of Marketing Environment, Economic, Social, Political, Physical, Technological, Demographic, International Environment.

### BLOCK 2

**CONSUMER BEHAVIOUR:-** Meaning of Consumer Behaviour, Need and Importance of Consumer Behaviour, Factors affecting Consumer Behaviour - economic factors, social and cultural factors, psychological factors, personal factors, distinction between Consumer and Customer

**MARKET SEGMENTATION:-** Concept, Basis for Market Segmentation, Benefits of Market Segmentation, Requires of sound Market Segmentation, Target Marketing, Product Positioning



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### BLOCK 3

**MARKETING MIX:-** Concept, Marketing Mix Elements - Product, Price, Place, Promotion, People, Process, Packaging

**PRODUCT DECISIONS:-** Concept of Product, Levels of Product, Product Mix Decisions, Product Line Decisions, Individual Product Decisions, Branding, Product Life-cycle - Stages and Strategies

**PRICING DECISIONS:-** Meaning, Factors influencing Product Pricing Decisions, Methods of Pricing

### BLOCK 4

**PLACE DECISIONS:-** Meaning, Channels of Distribution, Logistic Management.

**PROMOTION DECISIONS:-** Meaning, Steps in Promotion Mix, Elements of Promotion Mix - Advertising, Publicity, Sales Promotion, Personal Selling, Direct Marketing and Public Relations

**MARKETING RESEARCH:-** Meaning, Need and Scope of Marketing Research, Process of Marketing Research, Areas of Marketing Research.

### Reference Books :

1. Marketing Management : Philip Kotler,
2. Marketing Management : Rajan Saxena,
3. Marketing Management : Joseph P.Guiltonan & Gordon W.Paul,
4. Marketing Management : V.S.Ramaswami & S.Namakumari.
5. Marketing (The Oxford Textbook) : Keith Blois.
6. Fundamentals of Marketing : Willian J.Stanton & Michael J.Etzel.
7. Marketing Management : Dr.K.N.Sontakki,
8. Marketing Management : Sherlekar.

## Project work