

**Scheme of Teaching and Examinations for II Semester
DIPLOMA in Electrical/Mechanical/CSE (Group-I)**

THEORY

Sr. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION – SCHEME					
			Periods per Week	Periods in one Session (Year)	Hours of Exam.	Terminal Exam. (A) Marks	Final Exam. (B) Marks	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
1.	Engineering Mathematics-II	01201	06	60	03	20	80	100	26	36
2.	Basic of Computer & Information Technology	01202	04	60	03	20	80	100	26	36
3.	Basic Engineering Drawing	01203	12	120	04	20	80	100	26	36
4.	Electrical & Electronics Engg.	01204	06	60	03	20	80	100	26	36
5.	Surveying & Measurement	01205	04	50	03	20	80	100	26	36
			32		Total:-			500		

PRACTICAL

Sr. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION – SCHEME					
			Periods per Week	Periods in one Session (Year)	Hours of Exam.	Marks Internal Exam. (A)	Marks External Exam. (B)	Total Marks (A+B)	Pass Marks Final Exam.	Pass Marks in the Subject
6.	Basic of Computer & Information Technology Lab	01206	06	60	03	10	40	50	16	21
7	Field Survey Practice.	01207	Two weeks (12 days) continuous	60	04	20	80	100	32	42
			6		Total:			150		

SESSIONAL

Sr. No.	SUBJECTS	SUBJECT CODE	TEACHING SCHEME		EXAMINATION – SCHEME				
			Periods per week	Periods in one Session (Year)	Marks of Internal Examiner (X)	Marks of External Examiner (Y)	Total Marks (X+Y)	Pass Marks in the Subject	
8.	Basic Engineering Drawing	01208	-	-	20	30	50	25	
9.	Student Centered Activity (A Sessional of Language & Communication Skill)	01209	04	50	20	30	50	25	
			Total:-		4		100		
			Total Periods per week		42		Total Marks = 750		

ENGINEERING MATHEMATICS-II

Subject Code 01201/ 02101	Theory			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks		
	L	T	P/S	Annual Exam.	:	100
	06	—	—	Internal Exam.	:	80
					20	

Rationale:

The Subject of Engineering Mathematics is being introduced into the Diploma Course to provide mathematical background to the students so that they can be able to grasp the engineering subjects, which they will come across in their higher classes properly. The course will give them the insight to understand and analyse the engineering problems scientifically based on Mathematics. The subject is divided into two papers - Engineering Mathematics - I and Engineering Mathematics - II. The Curriculum of Engineering Mathematics - II consists of the following broad topics:

1. Calculus
2. Vector Algebra
3. Differential Equations

The details of the above broad topics have been provided in the curriculum:

Objectives:

- By covering the course in Engineering Mathematics - II, the students will be able to:
- Know the basics of Differential and Integral Calculus, the meaning of limit, continuity and derivative of a single variable and their applications to engineering problems, the various methods of integration, how to solve simple ordinary differential equation of 1st and 2nd order,
- Understand their engineering application
- Solve related simple numerical problems which will help them to understand the subject.

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>
01	Calculus	(36)
02	Vector	(12)
03	Differential Equations	(12)

CONTENTS:

TOPIC: 01 - CALCULUS:

		Periods
01.01	Functions: Constants, Variables, Functions, Graphical representation of function, odd & even functions, explicit & implicit functions & other types of functions.	[02]
01.02	Limits: Definition, fundamental Theorem, important formulas. And its important deductions, Simple problems.	[02]
01.03	Continuity of a function: Left hand limit and Right hand limit. Definition of a continuous function. Simple problems to test the continuity of a function.	[02]
01.04	Differentiation of a function: Increment, Differential co-efficient, Derivatives of an algebraic, trigonometric, exponential, logarithmic and inverse functions from first principle, Differentiation of Sum, Difference, Product, Quotient of two functions, Fundamental theorems of differentiation of implicit function, parametric functions & Logarithmic differentiation.	[06]
01.05	Geometric meaning: Significance of derivative and its sign, Geometric interpretation of dy/dx, Equation of tangents and normals to a curve. Angle between two curves.	[02]
01.06	Application of dy/dx: Approximate Calculations and Small Errors interpretation of dy/dx as a rate measure, practical problems, Maximum & Minimum functions of single variable.	[04]
01.07	Successive Differentiation: Definition and Notations, the nth derivatives of some special functions. Leibnitz theorem.	[03]
01.08	Partial Differentiation: Idea of a partial differentiation, partial derivatives, successive partial derivatives, Euler's Theorem on Homogeneous Functions, Partial Differentiation of Implicit Functions, Total Differential.	[03]
01.09	Integration: Integration as inverse process of differentiation, Introduction, Integration by transformation, Integration by Substitution and Integration by parts.	[05]
01.10	The Definite integral, Properties of the definite integral. Problem of area by Integration method.	[05]
01.11	The Definite integrals as the limit of a sum	[02]

TOPIC: 02 - VECTORS:

- 02.01 Introduction to Vectors: Definition of Scalars and Vectors with example, Representation of a vector, type of vectors (Unit vector, Zero vector, negative of a vector and Equality of vectors), Addition and Subtraction of vectors, Multiplication of vectors by a scalar. [02]
- 02.02 Position vector: Position vector of a Point Resolution of vectors (coplanar vectors and space vectors) : Point of Division, Centroid of triangle. Test of collinearity, coplanarity and linear dependence of vectors. [02]
- 02.03 Product of two vectors: Scalar or Dot Product, Vector or Cross Product. Geometrical interpretation and their properties. Work done as a scalar product. [04]
- 02.04 Product of three vectors: Scalar Product of three vectors, Vector Product of three vectors and its geometrical meaning. [04]

TOPIC: 03 - DIFFERENTIAL EQUATION:

- 03.01 Introduction: Definition of a Differential Equation, Formation of a Differential Equation, Ordinary and Partial Differential Equation, Order and Degree of a Differential Equation. [01]
- 03.02 Equation of first Order and first Degree: Solution of different types of equations: (i) Variable separable (ii) Homogeneous Equations (iii) Equation reducible to homogeneous form (iv) Linear Equations (v) Exact Differential Equations. [07]
- 03.03 Linear Differential Equations: with constant coefficients of orders two: Definition, complete solution Rules for finding the complementary function. Rules for finding the particular Integral, Simple Problems. [04]

Books Recommended:

Engineering Mathematics - II

- | | |
|--------------------------------------|--|
| 1. Mathematics for Class XI Part I | - NCERT/R. S. Aggawal |
| 2. Mathematics for Class XI Part II | - NCERT/R. S. Aggawal |
| 3. Mathematics for Class XII Part I | - NCERT/R. S. Aggawal |
| 4. Mathematics for Class XII Part II | - NCERT/R. S. Aggawal |
| 5. Calculus | - Dr. K.C. Sinha/ Laljee Pd./Das & Gupta |
| 6. Vector | - Dr. K.C. Sinha/ Laljee Pd./Das & Gupta |
| 7. Differential Equation | - Dr. K.C. Sinha/ Laljee Pd./Das & Gupta |

Reference Books:

- | | |
|---|------------------------------|
| 1. Engineering Mathematics - Part I & Part II | - H.K. Dass, S. Chand & Co. |
| 2. Polytechnic Mathematics for Diploma level | - H.K. Dass, S. Chand & Co. |
| 3. Solid Geometry | - Dr. K.C. Sinha/ Laljee Pd. |

BASIC OF COMPUTER & INFORMATION TECHNOLOGY

Subject Code 01202/ 02102	Theory			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	04	—	—	Internal Exam.	:	20

Rationale & Objective:

Today, all the workplaces and the living environmental are being computerised. In order to prepare diploma engineers to work in those environments, it is essential that they are exposed to various aspects of Information Technology such as understanding the concept of Information Technology and its scope, operating a computer, good working knowledge to work in DOS and Windows environment, using internet etc., form the broad competency profile of Diploma holders. This exposure will enable the students to enter the world with confidence, live in these environments in a harmonious way and contribute to the productivity.

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>
01	Introduction to Computer	
	01.01 Basics of Computer	(06)
	01.02 Input & Output Devices	(06)
	01.03 Memory	(04)
	01.04 Basics of Data & Information	(05)
02	Power Supply	(03)
03	Introduction to Operating System	(04)
	03.01 DOS	(07)
	03.02 Windows Operating System	(09)
	03.03 UNIX	(05)
	03.04 Windows NT	(05)
04	Computer & Communication	(06)
		(60)

CONTENTS:

TOPIC: 01 - INTRODUCTION TO COMPUTER:

History and evolution of Computers. Classification, application and limitations of different types of computers.

01.01	<u>Basics of Computer</u>	[06]
01.01.01	Computer Organisation, Block diagram of a Computer, C.P.U. Booting Process, Concepts of program & program implementation.	
01.01.02	Concepts of Hardware & Software; Operating System, System Software, Applications Software.	
01.01.03	Binary and other number systems and their conversion from one to other.	
01.01.04	Memory, bit, byte & word.	
01.01.05	ASCII and EBCDIC Codes - Machine Language, Assembly Language & High Level Language.	
01.01.06	Compilers, Assemblers, Loaders and Linkers.	
01.02	<u>Input & Output Devices</u>	[06]
01.02.01	Working of various Input Devices such as: <ul style="list-style-type: none"> • Key Board • Mouse • Joystick • Light Pen • Digitizers 	
01.02.02	Working of various Output devices such as: <ul style="list-style-type: none"> • Monitor/ V.D.U. (C.G.A., E.G.A., V.G.A., S.V.G.A.) • Different types of Printers and Plotters 	
	Scanners	
01.03	<u>Memory</u>	[04]
01.03.01	Primary & Secondary Memory, Primary Storage Media: RAM, ROM, PROM, EPROM, Cache, extended and expanded memory.	
01.03.02	Removable & non-removable secondary memory, Magnetic Tapes & Disks, CD ROM, DVD.	
01.03.03	Comparison of these devices based on technology (technical characteristics) & speed.	
01.03.04	Organisation of data on disks, tracks, sectors, cylinders.	
01.03.05	Heads, access time, seek time, latency time.	
01.03.06	Device controllers: serial port, parallel port, system bus.	

01.04	<u>Basics of Data & Information</u>	[05]
01.04.01	Introduction, Definition and application of data, difference between data and information.	
01.04.02	Data types, entities, attributes and relationship - Introduction only.	
01.04.03	Elements of Electronic Data Processing - different stages involved - processing methodologies. Transaction and Online Data Processing, Real Time Processing and their uses. Introductory Concepts of Text Processing and its applications.	
<u>TOPIC: 02 - POWER SUPPLY:</u>		[03]
02.01	N-E. Voltage, Earthings.	
02.02	Working of Constant Voltage Transformer (C.V.T.) - KVA & KW ratings.	
02.03	Working of Uninterrupted Power Supply (U.P.S.).	
02.04	Connections & Cables.	
<u>TOPIC: 03 - INTRODUCTION TO OPERATING SYSTEM:</u>		[04]
Concepts of Operating System, A brief history of operating system, definition.		
Operating System classification, single user, multi-user, batch processing, time-sharing, real time and multi-operating system.		
03.01	<u>DOS</u>	[07]
03.01.01	Introduction, Definition & Application of Operating System and types of OS, Introduction to DOS, Booting, File and Directory.	
03.01.02	Commands: Internal & External commands, Using various commands such as Directory commands, File Management commands, General commands, DISK Management commands, Edit commands.	
03.01.03	Batch file commands, Introduction to simple batch files.	
03.01.04	DOS Utility commands	
03.01.05	Security & Recovery of Data	
03.02	<u>Windows Operating System</u>	[09]
03.02.01	Concept of windows, overview of Graphic User Interface, Mouse, ICONS.	
03.02.02	Using the mouse & manipulation of ICONS, Menus and opening different applications simultaneously.	
03.02.03	Basic commands of windows: CREATE, MOVE, COPY, DELETE, RENAME a file or folder. Copy a file to floppy disk.	
03.02.04	Difference in Windows 95, 98 and 2000.	
03.02.05	Working with documents: changing, moving, deleting and saving information.	
03.02.06	Brief introduction of Windows Accessories like Notepad, Calculator etc.	
03.02.07	Printing: Setting up a printer and printing a document.	
03.02.08	Basic concepts of installing Windows and based packages.	
03.03	<u>UNIX</u>	[05]
03.03.01	Overview of UNIX, Comparison of DOS with UNIX.	
03.03.02	Log on and Log off, user passwords.	
03.03.03	Basic files/ directory manipulation commands.	
03.03.04	Concept of Shell and Kernel, Elements of V-I editor.	
03.04	<u>Windows NT</u>	[05]
03.04.01	Overview of Windows NT	
03.04.02	Concept of client server and Windows NT server	
03.04.03	Log on and Log off Control Panel	
03.04.04	Administrative tools, File Manager.	
<u>TOPIC: 04 - COMPUTER & COMMUNICATION:</u>		[06]
04.01	Introduction to Networking, Need and advantages.	
04.02	Introduction to Internet & Web Browser.	
04.03	Concept of LAN and WAN, Internet Protocol and TCP/IP.	
04.04	Applications of Internet like e-mail & browsing, PPP, SMTP, Terminal types.	
04.05	Down loading information from internet.	
04.06	Sending and receiving e-mail through standard e-mail clients.	

BASIC ENGINEERING DRAWING

Subject Code 01203/ 02103	Theory			No of Period in one session : 120		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	12	—	—	Internal Exam.	:	20

Rationale and Objective:

Drawing is said to be the language of engineers. All material objects have a shape and form, which can be represented by a combination of known geometrical figures. A thorough grounding in drawing to represent these objects on a plane is considered very essential for Diploma holders. Any construction or fabrication be it be a building, a factory or a machine has to begin with a drawing which forms the basis and guide to get the work done.

Drawing is commonly used mode of communication in the engineering industry. Proper exposure to drawing helps the students to translate different ideas into practice. Acquisition of skill will produce a drawing to represent a given object with sufficient knowledge to understand and interpret. As such drawing is regarded a pre-requisite for technician engineer.

With these objectives in view the following topics have been prescribed.

S.No.	Topic	Periods	No. of Plates
1.	Introduction	(06)	
2.	Lettering, Numbering & Dimensioning	(12)	01
3.	Conic Section	(24)	01
4.	Orthographic Projection	(39)	04
5.	Section views	(12)	01
6.	Isometric	(15)	01
7.	Development of Surfaces	(12)	01
		(120)	9 sheets

CONTENTS:

TOPIC: 01 - Introduction:

[06]

- 01.01 Importance of Engineering Drawing as graphic communication. Link between engineering drawing and other subjects of study in diploma course.
- 01.02. I. S. specification for preparation of drawings.
- 01.03 Use of drawing instruments and materials. Basic Tools- classification and brief description.
- 01.04 Special tools- Mini-drafter. Drafting Machine.
- 01.05 Scales, Recommended, reduced & enlarged scale.
- 01.06 Lines, Types of lines, Selection of line thickness.
- 01.07 Selection of Pencils.
- 01.08 Drawing sheets, different sheet sizes and standard layouts. Title block as per I. S. specification.
- 01.09 Care and maintenance of drawing material

TOPIC: 02 - LETTERING, NUMBERING & DIMENSIONING:

[12]

- 02.01 Importance of lettering. Different types of lettering as per B.I. S. code. Capital and small letters of vertical & slanting type as per B.I. S. code.
- 02.02 Numerical figures of vertical and slanting type as per B.I. S. code. Single stroke and double stroke, advantages.
- 02.03 Necessity of dimensioning. Principles and method of dimensioning and dimensioning practice as per I. S. I. code.
- 02.04 Making of centre line, Section line, dimensioning lines etc.
- 02.05 Drawing of plain and diagonal scales and dimensioning practice.
Tutorial & test

(02)

TOPIC: 03 - CONIC SECTION: [24]

- 03.01 Concept of Drawing and concept of conic section and its simple properties.
03.02 Concept of ellipse and its construction by various methods. Drawing of tangent & normal on ellipse.
03.03 Concept of parabola and its construction by various methods. Drawing of tangent & normal to parabola.
03.04 Concept of hyperbola and its construction by various methods. Drawing of tangent & normal to hyperbola.
Tutorial & Test (06)

TOPIC: 04 - ORTHOGRAPHIC PROJECTIONS : [39]

- 04.01 Principles of orthographic projection. Concept of horizontal, vertical and auxiliary planes. 1st angle and 3rd angle projection.
04.02 Projection of points on horizontal, vertical and auxiliary planes and its implication.
04.03 Projection of lines on different planes, Length of line and its true inclination with different planes and its traces.
04.04 Concept of orthographic projection of planes.
04.05 Projection of solids (Prism, Cone, Pyramids, Cylinder, Cube and tetrahedron etc.).
Tutorial & Test
Projection of Point and straight line 01 sheet
Projection of Planes and straight line 01 sheet
Projection of solids and straight line 02 sheet
04 sheet

TOPIC: 05 - SECTION VIEWS & AUXILIARY VIEWS : [12]

- 05.01 Concept of sectioning and drawing section lines, Need for drawing sectional views.
05.02 Section of simple geometrical solids-cases involving different types of cutting planes, single plane only
Tutorial & test (2)

TOPIC: 06 - ISOMETRIC, PICTORIAL [15]

- 06.01 Introduction to pictorial drawing. Brief description of different types of pictorial drawing viz Isometric, and their applications.
06.02 Concept of Isometric views. Isometric Projection and Isometric Scale.
06.03 Isometric Projection of simple solids, frustum of solids, truncated solids and sets of simple solids.
Tutorial & test (03)

TOPIC: 07 - DEVELOPMENT OF SURFACE: [12]

- 07.01 Development of surfaces of Cylinders, Prisms, Pyramids, cones and their frustum only.
Tutorial & test (02)

Books Recommended:

- | | |
|--|--|
| 1. Descriptive Geometry | - Abbot |
| 2. Elementary Engineering Drawing | - N. D. Bhatt |
| 3. Elementary Engineering Drawing | - S. C. Sharma |
| 4. Gyameetic Aarekhan (Hindi) | - Dadan, Ravindra, Daya Shankar Srivastava |
| 5. I.S.I. Specification on drawing | - |
| 6. Engineering Drawing | - R. K. Dhawan |
| 7. Engineering Drawing | - P. S. Gill |
| 8. Engineering Drawing | - Parkinson |
| 9. I. S.M. & S. S. M. on Technical Drawing | - T. T. T. I., Madras |

ELECTRICAL & ELECTRONICS ENGINEERING

Subject Code 01204/ 02104	Theory			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	06	-	-	Internal Exam.	:	20

Rationale & Objective:

The subject forms the foundation of electrical and electronics engineering. It prepares the students to familiarize with basic concepts and principles of electrical and electronics as these are encountered in every large and small installations of each type of industries. The diploma holders will be using machines and systems extensively which have electronics and electrical circuits inside. To understand their basic functioning, the students will be required to study the working principles, construction, characteristics, specifications and uses of basic devices and circuits.

Keeping in view the importance and relevance, this course has been developed and incorporated in the curriculum. The content has been divided into the following topics:-

PART-A

Electrical Engineering (Annual Exam : 40 marks)

S. No.	Topics	Periods
1.	Electro-magnetism	04
2.	D.C. Circuits	04
3.	D.C Machines	04
4.	A.C. Fundamentals	03
5.	A.C Machines	04
6.	Storage Batteries	03
7.	Measuring Instruments	02
8.	Electrical House Wiring	02
9.	Safety Devices	02
10.	Safety Procedure	02
Total		30

PART-B

Electronics Engineering (Annual Exam : 40 marks)

S. No.	Topics	Periods
1.	Resistor & Colour Code	05
2.	Semiconductor & Diodes	08
3.	Transistors	06
4.	Field effect transistor	06
5.	Digital Electronics	05
Total		30

PART-A

Electrical Engineering

Contents :

Topic 1. -Electro-Magnetism

(04)

- 01.01 Magnetic field due to current carrying straight conductor. Circuit loop and solenoid, Magnetic flux, Flux density
- 01.02 Force between two current carrying parallel conductors.
- 01.03 Magnetic circuit, series and parallel, Reluctance. Analog between magnetic and electric circuits.
- 01.04 Faraday's Laws of Electromagnetic induction. Lenz's law. Fleming Right hand rule.
- 01.05 Eddy current, its concept. Eddy current loss.
- 01.06 Induce e.m.f. dynamically and statically induced e.m.f.
- 01.07 Self and mutual inductance.
- 01.08 Energy stored in a magnetic field.
- 01.09 Related problems.

Topic 02. -D. C. Circuits

(04)

- 02.01 Ohm's law and Laws of resistance. Concept of resistivity and conductivity, their units and dependence on temperature in a conductor.
- 02.02 Kirchoff's Voltage and current laws and their application in simple circuits. (Simple idea only).
- 02.03 Star-delta transformation.
- 02.04 Thevenin's theorem, Norton's theorem, Super position theorem, Maximum power transfer theorem. (Simple idea only).
- 02.05 Related problems.

Topic 03. -D. C. Machines

(04)

- 03.01 D.C. Generator construction, principle, types.
- 03.02 D.C.Motors- working principle, Type
- 03.03 Starter- necessity and types.

Topic 04. - A.C. Fundamentals

(03)

- 04.01 Concept of Alternating current and voltage. Difference between A.C. and D.C. concept of cycle, Frequency, period, amplitude, instantaneous value. Average value, I.M.S. value and peak value. Form factor, (Definition only)
- 04.02 Power in A.C. circuits and power factors. (Basic idea only)
- 04.03 Alternating voltage applied to pure resistance, pure inductance and pure capacitance. (Simple idea only)
- 04.04 Poly phase and 3 phase circuits. Concept of line voltage and current in 3 phse star and delta system.

Topic 05. - A.C Machines

(04)

- 05.01 Transformer- principle construction.
- 05.02 Transformer Ratio, efficiency and rating.
- 05.03 Induction Motor- Principle, construction and types. (Simple idea)
- 05.04 Alternators- working principle. Brief idea.

Topic 06. - Storage Batteries

(03)

- 06.01 Cell - Primary and Secondary Cell.
- 06.02 Construction of Lead Acid battery (Brief idea only)
- 06.03 Methods of charging circuits on D.C. and A.C. Application.
- 06.04 Maintenance of Battery.
- 06.05 Study of Battery charges.

Topic 07. –Measuring Instruments

(02)

- 07.01 Classification of Instuments.
- 07.02 Watt Meter, Ammeter, Voltmeter, Frequency Meter and energy meter (Simple idea only).

Topic 08. –Electrical House Wiring

(02)

- 08.01 Switches, Socket and other itmes used in House wiring.
- 08.02 Types of House wiring (Brief idea only).

Topic 09. –Safety devices

(02)

- 09.01 Fuse- Introduction, Use of fuse, Idea about relay and circuit breakes.

Topic 10. –Safety Procedure

(02)

- 10.01 Effects of shocks and burns.
- 10.02 Procedures to be adopted in case of electrical shocks.

PART-B

Electronics

Topic: 01 – Resistor & Colour Code

[05]

- 01.01 Definition, Introduction, connection of Resistors, Condenser,Colour Code, Value calculation of resistors through colour code.

Topic: 02 - Semiconductor and Diodes

[08]

- 02.01 Conductors, Semiconductors, insulators, differences between them.
- 02.02 Conduction in intrinsic and extrinsic semiconductors. Concept of electrons and holes, Donor and acceptor impurities. P and N type semiconductors and their conductivity, drift and diffusion currents.

- 02.03 P-N Junction diode, Forward and Reverse bias, characteristics of P-N Junction and effect of Temperature, breakdown voltage.
- 02.04 Introduction - Zener Diode (Simple idea only)
- 02.05 Photo diodes.
- 02.06 Light Emitting diode.

Topic: 03 – Transistors [06]

- 03.01 Concept of Bipolar Transistor, PNP and NPN Transistors, Transistor action, Transistor configurations
- 03.02 Transistor as an amplifier. Classification of Amplifiers, CB, CC and CE amplifiers.

Topic: 04 - Field Effect Transistor [06]

- 04.01 Introduction, Classification, its application (Simple idea only)

Topic: 05 - Digital Electronics [05]

- 05.01 Number System, Binary number, Decimal number and Hexadecimal number, Conversion of each other.
- 05.02 Basic idea about Gates.
- 05.03 Introductory Concept of Memories.

Recommended Books

SL	Title	Author / Publisher
1.	Electrical Technology	- B. L. Threja-S. Chand & Co.
2.	Electrical Technology	- Edward Hyghes
3.	Basic Electrical Engineering	- P.S. Dhogal-McGraw Hill Publisher
4.	Basic Electrical Engineering	- J. B. Gupta-S. K. Kataria & Sons
5.	Basic Electricity	- B. R. Sharma-Staya Prakashan, N. Delhi
6.	Electronic Principles	- Malvino-Tata McGraw Hill
7.	Electronics & Radio Engineering	- M. L. Gupta
8.	Basic Electronics	- V.K. Mehta- S.Chand & Co. , New Delhi.
9.	Electronics Devices & Circuits	- Millman & Halkias-McGraw Hill
10.	Basic Electronics & Linear Circuits	- N. N. Bhargava & Kulshreshta-Tata McGraw Hills, New Delhi
11.	Basic Electronics	- Grob-Tata McGraw Hill, New Delhi
12.	Digital Electronics and Application	- Malvino Leach-McGraw Hills, New Delhi
13.	Introduction to Microprocessor	- Dr. B. Ram, Fhanpat Ray & Sons

SURVEYING & MEASUREMENT

Subject Code 01205 /02105	Theory			No of Period in one session : 50		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	04		—	Internal Exam.	:	20

Rationale & Objective:

Knowledge of surveying in respect of Land Survey and measurement is essential to all of the Engineering students. Any project can take off only after proper conduct of the desired survey work and preparation of the necessary map using the physical data. For these the knowledge of Land Survey is essential. The students must also develop the skill to measure by proper use of Survey instruction through the knowledge of surveying so that the technicians can fix the slope of floor. Conveyors, waste & water pipe-lines and fix the height of machines & chimneys. The following topics and contents will fulfill the objectives.

<u>S.No.</u>	<u>Topics</u>	<u>Periods</u>	<u>Tutorial</u>
1	General Introduction	(05)	1
2	Chain Surveying	(12)	2
3	Compass Surveying	(09)	2
4	Plane table Surveying	(06)	1
5	Levelling	(12)	3
6	Theodolite & Layout of Structure	(06)	1
		(50)	10

CONTENTS:

TOPIC: 01 - GENERAL INTRODUCTION:

01 Definition, Classification, Principle of Surveying. Vernier scales, GPS & GIS, Fundamental and its application. [05]

TOPIC: 02 - CHAIN SURVEYING:

02.01 Measurement of distance, different types of chain & tapes, testing of chain & its adjustment. Instruments used in chain survey, Ranging, Direct & Indirect Ranging, line ranger, error in length due to incorrect chain, chaining of sloping ground, error in chaining, Tape corrections. [12]

02.02 Chain Surveying, principle of chain surveying, surveying stations, base line, check line, tie line offsets, oblique offsets, booking field notes, field works. Instruments for setting-out right angles staffs and optical square, right angle with chain & tape, obstacles in chaining, cross staff survey plotting of chain survey.

TOPIC: 03 - COMPASS SURVEYING

03.01 Purpose, use & comparison with chain surveying traversing. [09]

03.02 Compass - prismatic & survey's compass, its description.

03.03 Bearing, meridians, type of bearing, Fore bearing & Back bearing, computation of included angles.

03.04 Local attraction causes, errors corrections, Dip, Declination.

03.05 Traversing with chain & compass, plotting of traverse survey. Closing error and its adjustment.

TOPIC: 04 - PLANE TABLE SURVEYING

04.01 Object & comparison with chain & compass surveying instruments used in plane table surveying. [06]

04.02 Setting up of plane table, centering, orientation & levelling.

04.03 Method of plane table surveying - (i) Radiation (ii) Intersection (iii) Traversing (iv) Resection.

04.04 Statement of two points & three points problem and their solution.

04.05 Errors in plane tabling & their elimination.

TOPIC: 05 - LEVELLING

05.01 Definition of terms used in levelling, instruments used in levelling and their description. [12]

05.02 Adjustment of the level, temporary adjustments. Bench marks, different types of B.M., change points, steps in levelling, Principle of levelling, reduction of levels, H.I. method, rise & fall method, booking of staff reading, examples on levelling.

05.03 Classification of levelling, fly levelling, longitudinal & cross-sectional levelling.

05.04 Curvature & refraction.

05.05 Elementary knowledge of contours, use & characteristic of contour lines.

TOPIC: 06 - THEODOLITE & LAYOUT OF STRUCTURES

06.01 Introduction, different parts of the theodolite. [06]

06.02 Temporary adjustments of the theodolite.

06.03 Measurements of horizontal and vertical angles.

06.04 Prolonging a line, bearing of a line. Ranging of a line.

Books Recommended:

1	Surveying & Levelling Part-I	- By T.P. Kanetkar & S.V. Kulkarni
2	Surveying Vol. I	- By B.C. Punamia
3	Surveying	- By Hussain & Nagraj
4	Surveying & Levelling	- By Agar
5	सर्वेक्षण	- जे. झा
6	सर्वेक्षण	- गुरुचरण सिंह
7	Plane & Geodetic Surveying Vol. I	- By David Clark

BASIC OF COMPUTER & INFORMATION TECHNOLOGY LAB

Subject Code 01206/ 02106	Practical			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	
	L	T	P/S	Annual Exam.	:	
	—	—	06	Internal Exam.	:	

RATIONALE

Today computers are no longer specified tools for some but now they are fact of life and have great influence on all aspect of life. Computerized work environment is an essential requirement. In order to increase employability of diploma holders, it is essential to train them to various aspects of Computer & information technology such as understanding the concept of Computer & information technology and its scope; operating a computer; use of various tools of MS office; using internet etc. This will enable the students to enter their professions with confidence, live in a harmonious way and contribute to the productivity.

Objectives:

Students will be able to:

1. Understand a computer system that has hardware and software components, which controls and makes them useful.
2. Understand the operating system as the interface to the computer system.
3. Use the basic functions of an operating system.
4. Set the parameter required for effective use of hardware combined with and application software.
5. Compare major OS like Linux and MS-Windows
6. Use file managers, word processors, spreadsheets, presentation software's and Internet.
7. Have hands on experience on operating system and different application software
8. Use the Internet to send mail and surf the World Wide Web.

TOPICS TO BE EXPLAINED THROUGH DEMONSTRATION

1. Information Technology – its concept and scope
2. Computers for information storage, information seeking, information processing and information transmission
3. Elements of computer system, computer hardware and software; data – numeric data, alpha numeric data; contents of a program, processing
4. Computer organization, block diagram of a computer, CPU, memory
5. Input devices; keyboard, mouse etc; output devices; VDU and Printer, Scanner, Plotter
6. Electrical requirements, inter-connections between units, connectors and cables
7. Secondary storage; magnetic disks – tracks and sectors, optical disk (CD and DVD Memory), primary and secondary memory; RAM, ROM, PROM etc., Capacity; device controllers, serial port, parallel port, system bus
8. Exercises on file opening and closing; memory management; device management and input – output (I/O) management with respect of windows
9. Installation concept and precautions to be observed while installing the system and software
10. Introduction about Operating Systems such as MS-DOS and Windows
11. Special features, various commands of MS word and MS-Excel
12. About the internet – server types, connectivity (TCP/IP, shell); applications of internet like: e-mail and browsing
13. Various Browsers like WWW (World wide web); hyperlinks; HTTP (Hyper Text Transfer Protocol); FTP (File Transfer Protocol)
14. Basics of Networking – LAN, WAN, Topologies

LIST OF PRACTICALS

1. Given a PC, name its various components and list their functions
2. Identification of various parts of a computer and peripherals
3. Practice in installing a computer system by giving connection and loading the system software and application software
4. Installation of DOS and simple exercises on TYPE, REN, DEL, CD, MD, COPY, TREE, BACKUP commands
5. Exercises on entering text and data (Typing Practice)
6. Installation of Windows 98 or 2000 or XP or Vista etc.
 - (1) Features of Windows as an operating system
 - Start
 - Shutdown and restore
 - Creating and operating on the icons
 - Opening closing and sizing the windows
 - Using elementary job commands like – creating, saving, modifying, renaming, finding and deleting a file
 - Creating and operating on a folder
 - Changing setting like, date, time color (back ground and fore ground)
 - Using short cuts
 - Using on line help

7. MS-WORD

- File Management:
Opening, creating and saving a document, locating files, copying contents in some different file(s), protecting files, Giving password protection for a file
- Page Set up:
Setting margins, tab setting, ruler, indenting
- Editing a document:
Entering text, Cut, copy, paste using tool- bars
- Formatting a document:
Using different fonts, changing font size and colour, changing the appearance through bold/ italic/ underlined, highlighting a text, changing case, using subscript and superscript, using different underline methods
- Aligning of text in a document, justification of document ,Inserting bullets and numbering
- Formatting paragraph, inserting page breaks and column breaks
- Use of headers, footers: Inserting footnote, end note, use of comments
- Inserting date, time, special symbols, importing graphic images, drawing tools
- Tables and Borders:
Creating a table, formatting cells, use of different border styles, shading in tables, merging of cells, partition of cells, inserting and deleting a row in a table
- Print preview, zoom, page set up, printing options
- Using Find, Replace options
- Using Tools like:
Spell checker, help, use of macros, mail merge, thesaurus word content and statistics, printing envelopes and labels
- Using shapes and drawing toolbar,
- Working with more than one window in MS Word,
- How to change the version of the document from one window OS to another
- Conversion between different text editors, software and MS word

8. MS-EXCEL

- Starting excel, open worksheet, enter, edit, data, formulas to calculate values, format data, create chart, printing chart, save worksheet, switching from another spread sheet
- Menu commands:
create, format charts, organise, manage data, solving problem by analyzing data, exchange with other applications. Programming with MS-Excel, getting information while working
- Work books:
Managing workbooks (create, open, close, save), working in work books, selecting the cells, choosing commands, data entry techniques, formula creation and links, controlling calculations, working with arrays
- Editing a worksheet, copying, moving cells, pasting, inserting, deletion cells, rows, columns, find and replace text, numbers of cells, formatting worksheet
- Creating a chart:
Working with chart types, changing data in chart, formatting a chart, use chart to analyze data
- Using a list to organize data, sorting and filtering data in list
- Retrieve data with MS – query: Create a pivot table, customising a pivot table. Statistical analysis of data
- Customise MS-Excel:
How to change view of worksheet, outlining a worksheet, customize workspace, using templates to create default workbooks, protecting work book
- Exchange data with other application: linking and embedding, embedding objects, linking to other applications, import, export document.

9. MS POWER POINT

- a) Introduction to start PowerPoint
 - How to start PowerPoint
 - Working environment: concept of toolbars, slide layout, templates etc.
 - Opening a new/existing presentation
 - Different views for viewing slides in a presentation: normal, slide sorter etc.
- b) Addition, deletion and saving of slides
- c) Insertion of multimedia elements
 - Adding text boxes
 - Adding/importing pictures
 - Adding movies and sound
 - Adding tables and charts etc.
 - Adding organizational chart

- d) Formatting slides
 - Using slide master
 - Text formatting
 - Changing slide layout
 - Changing slide colour scheme
 - Changing background
 - Applying design template
- e) How to view the slide show?
 - Viewing the presentation using slide navigator
 - Slide transition
 - Animation effects etc.

10. Internet and its Applications

- a) Log-in to internet
- b) Navigation for information seeking on internet
- c) Browsing and down loading of information from internet
- d) Sending and receiving e-mail
 - Creating a message
 - Creating an address book
 - Attaching a file with e-mail message
 - Receiving a message
 - Deleting a message

RECOMMENDED BOOKS

1. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Computers Today, by SK Basandara, Galgotia publication Pvt ltd. Daryaganj, New Delhi
3. MS-Office 2003/2007 for Everyone by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., New Delhi
4. Internet for Every One by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
5. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
6. Mastering Windows XP, BPB Publication, New Delhi
7. Computer Fundamentals by PK Sinha; BPB Publication, New Delhi
8. Fundamentals of Information Technology by Leon and Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
9. On Your Marks – Net Set Go Surviving in an e-world by Anushka Wirasinha, Prentice Hall of India Pvt. Ltd., New Delhi
10. Fundamentals of Information Technology by Vipin Arora, Eagle Prakashan, Jalandhar

FIELD SURVEY PRACTICE

Subject Code 01207 /02107	Practical			No of Period in one session : 60		
	No. of Periods Per Week			Full Marks	:	100
	L	T	P/S	Annual Exam.	:	80
	00	00	12 days continuous	Internal Exam.	:	20

Rationale & Objective:

After learning the theoretical paper, it is essential for students to have a practice for surveying in the field with the help of instruments and survey accessories learnt in theory, to develop desired skill in land surveying and measurement.

List of Activities: Field Work

S.No. Topic

- 1 Testing & adjustment of chain.
- 2 Chaining & Ranging a line and recording in the field book including taking offsets (using optical square & other instruments), doing chain survey.
- 3 Study of prismatic compass, setting of compass and taking bearings, traversing with compass & chain.
- 4 Study of plane table survey equipment, setting up of plane table, orientation of plane table, doing plane table survey by radiation, intersection and traversing.
- 5 Study of levels. Temporary adjustment of levels, taking staff reading on different stations & recording in level book, finding difference of level between two distant points. Plotting longitudinal section & cross-sections.
- 6 Taking out theodolite from the box mounting on the Tripod and placing it back. Study of theodolite, temporary adjustment of the theodolite, reading of vernier and calculation of least count and taking readings.

Books Recommended for Field Survey Practice (Practical):

- | | | |
|---|-----------------------------------|------------------------------------|
| 1 | Surveying & Levelling Part-I | - By T.P. Kanetkar & S.V. Kulkarni |
| 2 | Surveying Vol. I | - By B.C. Punamia |
| 3 | Surveying | - By Hussain & Nagraj |
| 4 | Surveying & Levelling | - By Agar |
| 5 | सर्वेक्षण | - जे. झा |
| 6 | सर्वेक्षण | - गुरुचरण सिंह |
| 7 | Plane & Geodetic Surveying Vol. I | - By David Clark |

BASIC ENGINEERING DRAWING

Subject Code 01208 /02108	Sessional			No of Period in one session :		
	No. of Periods Per Week			Full Marks	:	50
	L	T	P/S	Annual Exam.	:	30
	—	—	—	Internal Exam.	:	20

S.No.	Topic	No. of Plates
1	Lettering, Numbering & Dimensioning	01
2	Conic Section	01
3	-Projection of Points & Straight Lines	01
	-Projection of planes	02
	-Projection of solids	01
4	Sectional views	01
5	Isometric	01
6	Development of Surface	01
		09 Plates

STUDENT CENTERED ACTIVITIES
(Language & communication skill)
English & Hindi

Subject Code 01209 /02109	Sessional			No of Period in one session : 50		
	No. of Periods Per Week			Full Marks	:	50
	L	T	P/S	Annual Exam.	:	30
	—	—	04	Internal Exam.	:	20

Rationale:

The subject is being introduced to produce more opportunity to practice for development of writing and oral skill both in English and Hindi language to be a good and effective communicator.

While designing the curriculum it has also been thought to promote certain student centered activities complementary to the language and communication skill. The body and sign language is also an effective method of communication and should therefore be learnt to ensure the generation of self confidence and overall personality development of the student.

S.No.	Group	Topic	Periods
1	A	ENGLISH	20
2	B	HINDI	20
3	C	SELF & SOCIETY ORIENTED ACTIVITY	10
			<hr style="width: 20%; margin-left: auto; margin-right: 0;"/> 50

GROUP - A [ENGLISH]

S.No.	Topic	20 Periods
01	Practice on Debate, Group Discussion, Elocution and Public Speech.	
02	Practice on different role playing with emphasis on dress, behaviour, manner, personality.	
03	Practice on Letter/ Application Writing, Report Writing & Tender Notice.	

CONTENTS:

TOPIC 01 - Practice on Debate, Group Discussion, Elocution and Public Speech.:

The institute is free to undertake any topic that is current and relevant to the present need of individual, society, industrial growth, environment related to health, hygiene and sanitation, technological development and social problems etc. and a record of at least six topics is necessarily to be prepared for sessional examination.

TOPIC 02 - Practice on different role playing with emphasis on dress, behaviour, manner, personality:

- 02.01 As an executive/ supervisor
- 02.02 As an office secretary
- 02.03 As an interviewer
- 02.04 As an interviewee
- 02.05 As an office assistant
- 02.06 As a front desk operator
- 02.07 While going to a formal party

TOPIC 03 - Practice on Letter/ Application Writing, Report Writing & Tender Notice:

- 03.01 Letter/ Application writing
- 03.02 Report writing
- 03.03 Tender notice and advertisement

NOTE: Contents of the above topics are same as covered in theory papers and a record of at least two topic has to be necessarily prepared from each subtopic for sessional records.

S.No.	Topic
01	तौर-तरीके एवं आधारभूत शिष्टाचार
02	शारीरिक भाषा
03	जानकारी(डेस्क) कार्यालय का अग्रभाग
04	सामूहिक परिचर्चा, वाद-विवाद वक्तृता अथवा वक्तव्य
05	पत्र/ आवेदन लेखन, प्रतिवेदन लेखन, निविदा सूचना एवं विज्ञापन
06	अन्तर्वीक्षा के समय आचरण

CONTENTS:

पाठ्य 01 – तौर-तरीके एवं आधारभूत शिष्टाचार:

पाठ्य 02 – शारीरिक भाषा:

- शारीरिक भाव भंगिमा द्वारा सम्प्रेषण
- अतिविहित संकेत
- मुखाकृति द्वारा सम्प्रेषण
- पोशाक तथा प्रशासन द्वारा सम्प्रेषण

पाठ्य 03 – जानकारी(डेस्क) कार्यालय का अग्रभाग:

- टेलीफोन वार्तालाप(श्रष्टा/दृष्टा)
- कैसेट द्वारा अभ्यास

पाठ्य 04 – सामूहिक परिचर्चा, वाद-विवाद वक्तृता अथवा वक्तव्य:

उपर्युक्त पाठ्य के विषयों का चयन संस्थानों द्वारा ही निश्चित किये जायेंगे। विषय की प्रासंगिकता वर्तमान परिपेक्ष्य में हो तथा सामाजिक, औद्योगिक, स्वास्थ्य, वातावरण इत्यादि क्षेत्रों से सम्बन्धित हो।

पाठ्य 05 – पत्र/आवेदन लेखन, प्रतिवेदन लेखन, निविदा सूचना एवं विज्ञापन:

सात्रिक परीक्षा हेतु प्रत्येक से सम्बन्धित दो विषयों पर रिकार्ड तैयार करना आवश्यक होगा।

पाठ्य 06 – अन्तर्वीक्षा के समय आचरण:

GROUP - C [SELF & SOCIETY ORIENTED ACTIVITY]

Self Promotion and society oriented activity:

- Library study - Assessment will be made on the basis of exposition through debate
- To create awareness among rural mass about rural technology, sanitation, health and hygiene, drinking water etc.
- Participation in cultural activity
- Any other activity taken up by the institution - related to environment