



SYLLABUS

OF

**DIPLOMA IN ENGINEERING
FIRST YEAR (1st & 2nd Semester)**

Common to all braches

Edition-2014

Salient features in proposed Curriculum

1. The curriculum is structured to have 3 years (6 semesters) including Industrial training in an Organization / Industry relevant to the field of specialization. This is mainly aimed to improve the practical skills in the students to make them ready to cater to the needs of Industry with hands on experience and with a very good practical vision.
2. An effort has been made to improve the communication skills and personality development of the students, by restructuring the English Language / communication subject.
3. Primarily to develop verbal communication skills in English among students.
4. The main intention behind this is to improve their communication / presentation skills and to develop their personality to enable them to stand as a useful product in the global market.
5. Practicals on Information Technology are introduced in the I year curriculum itself. This enables the student to have good acquaintance with computers, internet and e-Mailing from First year onwards. It also enables the student to keep pace with latest trends of the present day technology.
6. Their knowledge and skills in computers are continued by introducing practical.
7. Developing reading & writing skills in students, especially among students who lack confidence in communicating in English.
8. Every effort has been made while structuring the curriculum to mould the students to become very good Technicians with more practical visualization. This has been done by deleting unnecessary and extra information and grouping the subjects to impart theoretical inputs to the students up to sufficient depth. This saving in time has been utilized in slightly improving on the practical inputs during in-house training itself.
9. Seminars also form a part of the curriculum in all the three years. This will surely improve the abilities of the students in communication / presentation skills.
10. Training to isolate important information from a written text and represent the same in note form.
11. Increase ability to write short paragraphs and to write technical reports.
12. To improve speaking skill of students through active listening & speaking practice.
13. Visualization and analytical approach towards the subject is necessary
14. To increase power of comprehending a written text.
15. Basic Mathematics knowledge to solve the problems.
16. Knowledge of basic concepts of sciences such as physics, chemistry and mathematics
17. Much emphasis has been given for practical subjects in both the semesters by allotment of separate subject codes. Also the examination time for all practical subjects is common and is fixed as 3 hrs duration. This allows the examiners (both internal and external) to pay much attention towards the examinee during practicals.

SURESH GYAN VIHAR UNIVERSITY
Teaching and Examination Scheme for Diploma in Engineering
I Year Diploma (Common to All Branches of Engg.)
Edition-2014

I Year

I Sem

S. No.	Course Code	Course Name	Credits	Contact Hrs/Wk.			Exam Hrs.	Weightage (in%)	
				L	T/S	P		CE	ESE
	(A)	Theory Papers							
1.	EN-131	English and Communication Skills-I	2	2	-	-	3	30	70
2.	PY-131	Physics-I	3	3	-	-	3	30	70
3.	CY-131	Chemistry-I	3	3	-	-	3	30	70
4.	MA-131	Mathematics-I	4	3	1	-	3	30	70
5.	CP-131	Computer & Information Technology Fundamentals	3	3	-	-	3	30	70
	(B)	Practicals & Sessionals							
6.	EN-171	Communication Skills - I Lab	1	-	-	2	3	60	40
7.	PY-171	Physics-I Lab	1	-	-	2	3	60	40
8.	CY-171	Chemistry-I Lab	1	-	-	2	3	60	40
9.	CP-171	Computer & Information Technology Fundamentals Lab	1	-	-	2	3	60	40
10.	ME-171	Engineering Drawing –I Lab	2	-	-	3	3	60	40
	(c)	Discipline & Co Curricular Activities							
11.	DC-101	Discipline & Co Curricular Activities	2	-	-	-		100	-
		Total	23	14	01	11		-	-
		Total Teaching Load	-	26	-	-		-	-

SURESH GYAN VIHAR UNIVERSITY
Teaching and Examination Scheme for Diploma in Engineering
I Year Diploma (Common to All Branches of Engg.)
Edition-2014

I Year

II Sem

S. No.	Course Code	Course Name	Credits	Contact Hrs/Wk.			Exam Hrs.	Weightage (in%)	
				L	T/S	P		CE	ESE
	(A)	Theory Papers							
1.	EN-132	English and Communication Skills –II (Dev of like Skill & Professional Practices)	2	2	-	-	3	30	70
2.	PY-132	Physics-II	3	3	-	-	3	30	70
3.	CY-132	Chemistry-II	3	3	-	-	3	30	70
4.	MA-132	Mathematics-II	4	3	1	-	3	30	70
5.	ME-134	Applied Mechanics	3	3	-	-	3	30	70
	(B)	Practicals & Sessionals							
6.	EN-172	Communication Skills-II Lab	1	-	-	2	3	60	40
7.	PY-172	Physics-II Lab	1	-	-	2	3	60	40
8.	CY-172	Chemistry –II Lab	1	-	-	2	3	60	40
9.	ME-172	Engineering Drawing- II Lab	2	-	-	3	3	60	40
10.	ME-174	Work Shop Practice	1	-	-	2	3	60	40
11.	EE-172	Basic Electrical and Electronics Engg. Lab	1	-	-	2	3	60	40
	(C)	Discipline & Co Curricular Activities							
12.	DC-102	Discipline & Co Curricular Activities	2	-	-	-		100	-
		Total	24	14	01	13		-	-
		Total Teaching Load	-	28	-	-		-	-

SURESH GYAN VIHAR UNIVERSITY
I Year Diploma (Common to All Branches of Engg.

LIST OF COURSES OFFERED

Edition-2014

S. No.	Course Code	Course Name	Credits	Contact Hrs/Wk.			Exam Hrs.	Weightage (in%)	
				L	T/S	P		CE	ESE
1.	EN-131	English and Communication Skills-I	2	2	-	-	3	30	70
2.	EN-132	English and Communication Skills –II (Dev of like Skill & Professional	2	2	-	-	3	30	70
3.	EN- 171	Communication Skills - I Lab	1	-	-	2	3	60	40
4.	EN-172	Communication Skills-II Lab	1	-	-	2	3	60	40
5.	PY-131	Physics-I	3	3	-	-	3	30	70
6.	PY-132	Physics-II	3	3	-	-	3	30	70
7.	PY- 171	Physics -I Lab	1	-	-	2	3	60	40
8.	PY-172	Physics-II Lab	1	-	-	2	3	60	40
9.	CY131	Chemistry-I	3	3	-	-	3	30	70
10.	CY132	Chemistry-II	3	3	-	-	3	30	70
11.	CY-171	Chemistry-I Lab	1	-	-	2	3	60	40
12.	CY-172	Chemistry-II Lab	1	-	-	2	3	60	40
13.	MA-131	Mathematics-I	4	3	1	-	3	30	70
14.	MA-132	Mathematics-II	4	3	1	-	3	30	70
15.	ME-134	Applied Mechanics	3	3	-	-	3	30	70
16.	ME- 171	Engineering Drawing –I lab	2	-	-	3	3	60	40
17.	ME-172	Engineering Drawing –II Lab	2	-	-	3	3	60	40
18.	ME-174	Work Shop Practice	1	-	-	2	3	60	40
19.	CP- 131	Computer & Information Technology Fundamentals	3	3	-	-	3	30	70
20.	CP- 171	Computer & Information Technology Fundamentals Lab	1	-	-	2	3	60	40
21.	EE- 172	Basic Electrical and Electronics Engg. Lab	1	-	-	2	3	60	40
22.	DC- 101	Discipline & Co Curricular Activities	2	-	-	-		100	-
23.	DC-102	Discipline & Co Curricular Activities	2	-	-	-		100	-

UNIT	CONTENTS OF THE COURSE
I	Basic Sentence Patterns –I Basic Sentence Patterns. (Nine basic 5 sentence patterns)
II	Basic Sentence Patterns -II Transformation of Sentences, Determines, Preposition
III	Tenses : Tenses, Question Tags
IV	Common Errors (Noun, Pronoun, Articles, Adverb, Punctuation, Preposition etc.)
V	Narration - Direct - indirect, Voice - Active - Passive

REFERECE BOOKS :

1. Intermediate English Grammar Raymond Murphy, Foundation Books, New Delhi.
2. Eng. Grammar, usage & Composition Tickoo & Subramanian S.Chand and Co.
3. Living Eng. Structure Stannard Alien, Longman.

UNIT	CONTENTS OF THE COURSE
I	BASIC SENTENCE PATTERNS-I Narration, Voice, Basic Sentence Patterns. (Nine basic sentence patterns)
II	BASIC SENTENCE PATTERNS-II Transformation of Sentences, Determiners, Preposition.
III	TENSES : Tenses, Common errors (Noun, Pronoun, Articles, Adverb, Punctuation, Preposition etc.)
IV	Modals in Conversational Usage Prefix, Suffix, Idioms & Phrasal verbs : Can, Could, Should ,Will, Would, May, Might, Must, Need not, Dare not, Ought to, Used to. Phrases :At all; In stead of; In Spite of; As well as; Set up; Up set; Look up; Call off; Call out; Come across; Set right; Look other. Idioms Work up (excite); Break down; Stand up for; Turn down; Pass away; Pass on; Back up; Back out; Carry out; Done for (ruined); Bring about; Go through; Ran over; Look up (improve); Pick out
V	Composition - Precis Writing ,Letter writing,paragraph writing ,report writing, Essay writing ,Unseen passage

REFERECE BOOKS :

1. Intermediate English Grammar Raymond Murphy, Pub: Foundation Books, New Delhi
2. Eng. Grammar, usage & Composition Tickoo & Subramanian Pub: S.Chand and Co.
3. Living Eng. Structure Stannard Alien. Pub: Longman
4. A Practical Eng. Grammar Thomson and Martinet. (and its Exercise Books) Pub : ELBS
5. High School English Grammar Wren & Martin. and Composition.

UNIT	CONTENTS OF THE COURSE
I	Listening Skill development :For improving listening skills the following steps are recommended, Listen to Prerecorded Tapes /Work on language proficiency software , Reproduce Vocally what has been heard Reproduce in Written form Summarise the text heard , Suggest Substitution of Words and Sentences Answer Questions related to the taped text ,Summarise in Writing
II	Speaking Skills : Introducing English consonant-sounds and vowel-sounds. Remedial exercises where necessary ,Knowing Word stress ,Shifting word stress in poly-syllabic words .Work with language software
III	Vocabulary: Synonyms. Homonyms. Antonyms and Homophones Words often confused, as for example, [I-me; your-yours; its-it's; comprehensible-comprehensive; complement-compliment] Context-based meanings of the words, for example, man[N] man[vb]; step[N ,step[vb] conflict _____Israel Palestinian conflict ,Emotional conflict, Ideas conflict
IV	Personality Development Delivering Short Discourses: About oneself , Describing a Place, Person, Object ,Describing a Picture, Photo.
V	Group Discussion : Presentation and Interview skills

REFERECE BOOKS:

1. A Practical Eng. Grammar Thomson and Martinet. (and its Exercise Books),ELBS.
2. High School English Grammar and Composition Wren & Martin.

PRACTICALS:

We envisage two successive stages for attaining skill in communication ability;

1. Listening
2. Speaking

We can club them together as shown above.

1. Listening:

(1) For improving listening skills the following steps are recommended, .

- (a) Listen to Prerecorded Tapes.
- (b) Reproduce Vocally what has been heard.
- (c) Reproduce in Written form.
- (d) Summarise the text heard.
- (e) Suggest Substitution of Words and Sentences.
- (f) Answer Questions related to the taped text.
- (g) Summarise in Writing.

2. Speaking:

(1) Introducing English consonant-sounds and vowel-sounds.

- Remedial exercises where necessary

(2) Knowing Word stress

Shifting word stress in poly-syllabic words

[For pronunciation practice read aloud a para or page regularly while others monitor]

3. Vocabulary:

(1) Synonyms. Homonyms. Antonyms and Homophones

(2) Words often confused, as for example,

[I-me; your-yours; its-it's; comprehensible-comprehensive; complement-compliment]

(3) Context-based meanings of the words, for example,

- (a) man[N] man[vb]; step[|N| ,step[vb].
- (b) conflict _____ Israel Palestinian conflict
Emotional conflict,
Ideas conflict
- (c) learn —— 1 learn at this school
I learnt from the morning news.

4. Delivering Short Discourses:

- (a) About oneself .
- (b) Describing a Place, Person, Object.
- (c) Describing a Picture, Photo.

5. Group Discussion :

- (1) Developing skill to initiate a discussion [How to open]
- (2) Snatching initiative from others [Watch for weak points, etc.]

6. Expand a topic-sentence into 4-5 sentence narrative.

Note :

1. The Medium of teaching and examination will be English.
2. The Question on Essay Writing (Unit-7) will be compulsory. The student will have to attempt one essay out of two, touching the given points on general/ local topic related to environmental problems.
3. At least one question will be set from each unit.
4. No theory question will be set from syllabus of practicals.

REFERECE BOOKS :

1. Intermediate English Grammar Raymond Murphy, Pub: Foundation Books, New Delhi
2. Eng. Grammar, usage & Composition Tickoo & Subramanian Pub: S.Chand and Co.
3. Living Eng. Structure Stannard Alien. Pub: Longman
4. A Practical Eng. Grammar Thomson and Martinet. (and its Exercise Books) Pub : ELBS
5. High School English Grammar Wren & Martin. and Composition

Unit No	Description of Unit	No. hours
I	1. Units and Dimensions: 1.1 Idea of various systems of units SI units - Basic, Supplementary and Derived Units, Prefixes & Symbols 1.2 Dimensions and Dimensional Formulae 1.3 Principle of Homogeneity of Dimensions 1.4 Dimensional Analysis 1.5 Applications and Limitations	6
II	2. Elasticity: 2.1 Elasticity 2.2 Stress and Strain 2.3 Elastic Limit & Hooke's law 2.4 Young's Modulus, Bulk Modulus & Modulus of Rigidity, Poisson's Ratio	4
III	3. Properties of Liquids: 3.1 Surface Tension & Surface Energy 3.2 Cohesive & Adhesive Force 3.3 Angle of Contact 3.4 Capillarity & Expression for Surface Tension 3.5 Streamline & Turbulent Flow 3.6 Reynolds Number. 3.7 Viscosity & Coefficient of Viscosity 3.8 Stoke's law & Terminal Velocity	7
IV	4. Gravitation & Satellites: 4.1 Newton's law of Gravitation 4.2 Acceleration due to Gravity 4.3 Kepler's laws of Planetary Motion (statement only) 4.4 Artificial Satellite (simple idea), Geo-Stationary Satellites 4.5 Escape Velocity	6

	4.6 Velocity & Time Period of an Artificial Satellite.	
V	5. Transfer of Heat: 5.1 Modes of Transmission of Heat - Idea of Conduction, Convection & Radiation 5.2 Thermal Conductivity & Coefficient of Thermal Conductivity 5.3 Black Body 5.4 Kirchoff's Laws & Stefan Boltzmann Law (statement only) 5.5 Newton's Law of Cooling & its Derivation from Stefan's Law	7
	Total No of Hours	30

REFERENCE BOOKS:

1. Engineering Physics Gaur & Gupta
2. Applied Physics Vol.-I Hari Harlal, NITTTR
3. Applied Physics Vol.-II Hari Harlal, NITTTR
4. A Text Book of Applied Physics N.S. Kumar
5. Principles of Physics Brijlal, Subhramanyam

Unit No	Description of Unit	No. hours
I	1. Electrostatics and D.C. Circuits: 1.1 Coulomb's Law 1.2 Intensity of Electric Field, Intensity due to a Point Charge 1.3 Electric Lines of Forces & Electric Flux 1.4 Electric Potential, Electric Potential due to a Point Charge 1.5 Resistivity, Effect of Temperature on Resistance 1.6 Ohm's Law 1.7 Resistance in Series and Parallel and their Combination 1.8 Kirchoff's Law 1.9 Wheatstone Bridge 1.10 Meter Bridge	08
II	2. A.C. Circuits and Modern Physics: 2.1 Faraday's Laws of Electro Magnetic Induction, Lenz's Law 2.2 Self and Mutual Inductance 2.3 Alternating Current, Phase & Phase Difference 2.4 Instantaneous, Average and rms value of AC 2.5 Behaviour of Resistance, Capacitance and Inductance in an AC Circuit 2.6 AC Circuits Containing, R-L, R-C and LCR in Series 2.7 Power in AC Circuit and Power Factor 2.8 Photo Electric Effect 2.9 Einstein's Equation	08
III	3. Semi Conductor Physics: Energy Bands in Conductor, Semi Conductor & Insulator 3.2 Chemical Bonds in Semiconductor 3.3 Intrinsic and Extrinsic Semiconductors 3.4 PN-Junction Diode, Working, Biasing and Characteristics Curves 3.5 Zener Diode and Voltage Regulation using it 3.6 Half Wave & Full Wave Rectifiers (only working, no derivations)	06

IV	4. Nuclear Physics, Pollution and its control: 4.1 Mass - Defect and Binding Energy 4.2 Nuclear Reactions 4.3 Natural and Artificial Radioactivity 4.4 Law of Radioactive Disintegration 4.5 Half Life & Mean Life. 4.6 Idea of Nuclear Fission and Fusion 4.7 Chain Reaction.	05
V	5. Transfer of Heat: 5.1 Modes of Transmission of Heat - Idea of Conduction, Convection & Radiation 5.2 Thermal Conductivity & Coefficient of Thermal Conductivity 5.3 Black Body 5.4 Kirchoff's Laws & Stefan Boltzmann Law (statement only) 5.5 Newton's Law of Cooling & its Derivation from Stefan's Law	07
	Total	34

REFERENCE BOOKS:

1. Engineering Physics Gaur & Gupta
2. Applied Physics Vol.-I Hari Harlal, NITTTR
3. Applied Physics Vol.-II Hari Harlal, NITTTR
4. A Text Book of Applied Physics N.S. Kumar
5. Principles of Physics Brijlal, Subhramanyam

List of Practicals:

1. To Measure Internal Diameter, External Diameter and Depth of a Calorimeter using Vernier Calliper's.
2. To Measure Density of a Wire using Screw gauge.
3. To Measure Radius of Curvature of a Lens, Mirror using Spherometer.
4. To Determine Refractive Index of Glass using Prism.
5. To Determine the Refractive Index of Glass using Travelling Microscope.
6. To Determine Focal Length of a Convex Lens by Displacement Method.
7. To Determine the Velocity of Sound at 0°C using Resonance Tube.
8. To Determine Young's Modulus of Elasticity using Searle's Apparatus.

REFERECE BOOKS :

1. **Engineering Physics Gaur & Gupta**
2. **Applied Physics Vol.-I Hari Harlal, NITTTR**
3. **Applied Physics Vol.-II Hari Harlal, NITTTR**
4. **A Text Book of Applied Physics N.S. Kumar**
5. **Principles of Physics Brijlal, Subhramanyam**

1. To Determine Acceleration due to Gravity using Simple Pendulum.
2. To Verify Newton's Law of Cooling.
3. To Verify Law of Resistances.
4. To Determine Specific Resistance of Material using Meter Bridge.
5. To Determine Internal Resistance of a Primary Cell using Potentiometer.
6. To Compare emf of two Primary Cells using a Potentiometer.
7. To Draw Characteristic Curves of PN Diode and Determine its Static and Dynamic Resistance.
8. To Draw Characteristic Curves of a PNP/NPN Transistor in CB/CE Configuration..
9. To Measure Resistance of a Galvanometer by Half-Deflection Method.

REFERECE BOOKS :

1. **Engineering Physics Gaur & Gupta**
2. **Applied Physics Vol.-I Hari Harlal, NITTTR**
3. **Applied Physics Vol.-II Hari Harlal, NITTTR**
4. **A Text Book of Applied Physics N.S. Kumar**
5. **Principles of Physics Brijlal, Subhramanyam**

UNIT	CONTENTS OF THE COURSE	HOURS
I	Atomic Structure and Chemical Bonding :Atomic Structure : Bohr model of atom [Radius and Energy of H – atom is excluded] , De Broglie modification, Quantum numbers, Orbits and Orbitals, Aufbau principal, Pauli's Exclusion principle, Hund's rule of maximum multiplicity, Electronic configuration of elements upto atomic number 36. Definition of Atomic number, Mass number, Isotopes, Isotones and Isobars with suitable examples. Concept of hybridization sp ³ , sp ² , sp and shape of molecules (simple example H ₂ O, NH ₃ , BCl ₃ , BeCl ₂)Chemical Bonding: Electrovalent, Covalent and coordinate bonds, H-bond in HF, water and ice. Classification of solids – crystalline and amorphous. Relationship between structure and properties of the following crystalline solids- (i) Ionic solid i.e. Sodium chloride (ii) Covalent solid i.e. diamond and graphite	9
II	Avogadro Concept , Acids , Bases & Salts Avogadro number, Mole concept, Simple numerical problems involving Weight and volume. Acids, Bases and Salts (Arrhenius and Lewis concept) Basicity of acids and Acidity of bases, Neutralization reaction, Hydrolysis of Salts,. Equivalent Weight of acids, bases, & salts of Strength of Solution ---- normality, molarity, molality, formality and percentage strength, standard solution primary and secondary standards, concept of pH, and pH scale, Indicators and choice of indicator, principles of acidimetry and alkalimetry (simple numerical problems) Buffer solution (excluding numerical problems) Solubility product principle (excluding numerical problems), common ion effect with relation to group analysis.	7
III	Oxidation, Reduction, Electrochemistry Oxidation and Reduction by electronic concept, balancing chemical equations by Ion-electron method, Redox Titration, Electrolysis, Arrhenius theory, Faraday's Laws, Electrolysis of CuSO ₄ solution using Pt-electrode and Cu-electrode, simple numerical problems on electrolysis, Application of electrolysis such as Electroplating, Electrorefinings and Electrotyping, Electrochemical Cells, Primary Cell- Dry Cell, Secondary Cell --- Lead storage cell, Electrochemical series.Reversible and irreversible reactions, Exothermic and Endothermic reactions, concept of chemical equilibrium, Lechatelier's principle, Industrial preparation of Ammonia by Haber's Process,	9
IV	Minerals, Ores, Gangue, Flux, Slag, General method of extraction of metals with reference to Iron , Metallurgy copper and Aluminium (detailed method of extraction is excluded) Definition of Alloy, purposes of making Alloy, Composition and uses of alloys (Brass, Bronze German Silver, Duralumin, Nichrome, Bell metal, Gun metal, Monel metal, Alnico, Dutch metal, Babbit metal, stainless steel), Amalgams, properties and uses of cast iron, wrought iron, steel and sponge iron , Manufacture of steel by L-D process, composition and uses of different alloy steels.	7
V	Organic compounds , their differences from inorganic compounds, Classification, Homologous series, Functional groups, Isomerism, Nomenclature up to C ₅ , properties and preparation of Methane, Ethylene and Acetylene,	7
Total		39

Text Books:

- 1.S. S. Dara Environmental chem. & pollution control S. Chand Publication
 - 2.Dr. Aloka Debi A Text Book of Env. Engg. Dhanpat Rai Publishing Co.
 - 3.Jain & Jain Engg. Chem. Dhanpat Rai Publishing Co.
- Jain & Jain Engg. Chem. Dhanpat Rai Publishing Co.
 Dr. Aloka Debi A Text Book of Env. Engg. Dhanpat Rai Publishing Co.
 Shrieve Atkins Industrial Chemistry
 Bahl & Bahl A Text Book of Organic Chemistry S. Chand Publication
 M. M. Uppal Engg. Chemistry
 S. N. Poddar & S. Ghosh General & Inorganic. Chemistry Book Syndicate Pvt. Ltd.
 Harish Kr. Chopra Anupama Parkar Engg. Chemistry

UNIT	CONTENTS OF THE COURSE	HOURS
I	Water technology Introduction –soft and hard water – causes of hardness – types of hardness disadvantages of hard water – degree of hardness (ppm) – softening methods – permutit process – ion exchange process – numerical problems related to degree of hardness –drinking water – municipal treatment of water for drinking purpose – Osmosis, Reverse Osmosis - advantages of Reverse osmosis	9
II	Lubricant Definition, purpose and types of lubrication, names of common lubricants and uses, Flash point, Fire point, Pour point, Cloud point, selection of lubricant.	7
III	Cement : Portland cement: Raw materials, Composition and Manufacture, Setting and Hardening of cement, function of gypsum, Cement Mortar, Cement concrete, Lime mortar, plaster of paris. :	9
IV	Corrosion : Definition, Causes of Corrosion and methods of prevention, Refractories --- properties and use of Boron Carbide and Carborandirm , Asbestors, Glass, Ceramics, Cork (preliminary idea only). Paints : Composition , types (Snowchem, distemper) Varnishes : Definition , types , difference from paint, uses, characteristics. Metallic coating : Galvanisation, Electroplating, Tin plating. Lacquers.	7
V	Polymers : Definition & classification of Synthetic polymers Synthetic plastic : Thermoplastic plastic and Thermosetting plastic --- their differences with examples, preparation and uses of Polythene, PVC, Polypropylene, Polystyrene, Teflon, Bakelite, Orlon, Saran. Synthetic rubber : Buna –S, Buna –N, Neoprene, Butyl, rubber, silicone, Vulcanization of rubber. Synthetic Fibres : Nylon , Terylene , Rayon.	7
	Total	39

Text Books:

- 1.S. S. Dara Environmental chem. & pollution control S. Chand Publication
- 2.Dr. Aloka Debi A Text Book of Env. Engg. Dhanpat Rai Publishing Co.
- 3.Jain & Jain Engg. Chem. Dhanpat Rai Publishing Co.

Reference Books:

- Jain & Jain Engg. Chem. Dhanpat Rai Publishing Co.
 Dr. Aloka Debi A Text Book of Env. Engg. Dhanpat Rai Publishing Co.
 Shrieve Atkins Industrial Chemistry
 Bahl & Bahl A Text Book of Organic Chemistry S. Chand Publication
 M. M. Uppal Engg. Chemistry
 S. N. Poddar & S. Ghosh General & Inorganic. Chemistry Book Syndicate Pvt. Ltd.
 Harish Kr. Chopra Anupama Parkar Engg. Chemistry

Laboratory Experiments :

1. To identify the following Basic Radicals by dry and wet tests – Pb +2 , Cu +2, Al+3, Fe+3, Zn+2, Ni+2 Ca+2 Mg+2, Na+, K+, NH₄+2
2. To identify the following Acid Radicals by dry and wet tests – Cl- , CO₃-2 , SO₄-2, S-2 , NO₃-3 To identify an unknown water soluble salt containing one basic and one acid radical as mentioned above.
3. To perform titration of (N/10) approximate solution of an alkali with an unknown solution of an acid supplied.
4. To determine Iron content in Mohr's salt by standard K₂Cr₂O₇ solution.
5. Preparation of Potash Alum

Books Reference:

1. Engineering Chemistry II (Hindi) Mathur and Agarwal.
2. Chemistry of Engineering Materials C.V. Agarwal.
3. Engineering Chemistry P.C. Jain and Monika.
4. Engineering Chemistry M.M. Uppal.
5. Engineering Chemistry V.P.Mehta Jain Bros. Jodhpur.
6. Practical Chemistry for Engineers Virendra Singh.
7. Hand book of Technical Analysis Bannerji Jain Bros.Jodhpur.
8. Engineering Chemistry-I(Hindi) Mathur & Agrawal.
9. Inorganic Chemistry Shivhare & Lavania.
10. Organic Chemistry Kumar & Mehnot.
11. Practical Engineering Chemistry Dr Renu Gupta & Dr Sapana Dubey.
12. A Text book of Engineering Chemistry S. K. Jain & K. D. Gupta.
13. Engineering Chemistry Dr. K.L. Menaria & Dr Praveen Goyal

List of Experiments

1. Introduction to volumetric analysis
2. Preparation of Standard Na_2CO_3 solution
3. Estimation of HCl solution using Std. Na_2CO_3 solution
4. Estimation of NaOH using Std. HCl solution
5. Estimation of Mohr's Salt using Std. KMnO_4 solution
6. Determination of acidity of water sample
7. Determination of alkalinity of water sample
8. Determination of total hardness of water using Std. EDTA solu
9. Estimation of Chlorides present in water sample

DEMONSTRATION EXPERIMENTS

10. Estimation of total solids present in water sample
11. Determination of pH using pH meter.
12. High volume air sampler.
13. Explain Lewis theory of acids and bases and its limitations.
14. Applications of buffer solutions
15. Composition and uses of following Alloys: Brass, German silver, Nichrome
16. Define conductor Insulator, Electrolyte and Non – electrolyte
17. Explain the mechanism of rusting of iron

Books Reference:

1. Engineering Chemistry II (Hindi) Mathur and Agarwa.l
2. Chemistry of Engineering Materials C.V. Agarwal.
3. Engineering Chemistry P.C. Jain and Monika.
4. Engineering Chemistry M.M. Uppal.
5. Engineering Chemistry V.P.Mehta Jain Bros. Jodhpur.
6. Practical Chemistry for Engineers Virendra Singh.
7. Hand book of Technical Analysis Bannerji Jain Bros..Jodhpur.
8. Engineering Chemistry-I(Hindi) Mathur & Agrawal.
9. Inorganic Chemistry Shivhare & Lavania.
10. Organic Chemistry Kumar & Mehnot.
11. Practical Engineering Chemistry Dr Renu Gupta & Dr Sapana Dubey.
12. A Text book of Engineering Chemistry S. K. Jain & K. D. Gupta.
13. Engineering Chemistry Dr. K.L. Menaria & Dr Praveen Goyal

Units	CONTENTS OF THE COURSE	Hours
I	Algebra : Complex Numbers, Algebra of complex numbers. Conjugate of a complex number. Modulus and Amplitude of a complex number. Triangular inequalities. Square root of a complex number.	6
II	Trigonometry : Trigonometrical ratios of allied angles [$\sin(90^\circ \pm A)$, $\sin(180^\circ \pm A)$ etc.]. Sum and Difference formulae and their applications. Product formulae. T-Ratios of multiple and sub-multiple angles (2A, 3A, A/2). Solution of Trigonometrical equations.	6
III	Matrices and Determinants : Definition and properties of Determinants. Definition and types of Matrices, Transpose of a matrix, Minors and Cofactors, Adjoint of a matrix, Inverse of matrix Cramer's rule, Solution of simultaneous linear equations by Inverse matrix method. Characteristic matrix Characteristic equation, Eigen values and Eigen vectors, Cayley Hamilton theorem(Verification only).	7
IV	Coordinate Geometry : Distance formula, Ratio formula. Coordinates of Centroid, In-centre, Ortho-centre and Ex-centre of a triangle, Area of a triangle. Equation of a straight line in General form, Slope form, Intercept form, Perpendicular form. Equation of a line passing through one point and passing through two points, Angle between two lines. Perpendicular distance of a line from a point.	8
V	Conic Section : Circle : Definition and equation of a circle in General and standard forms, Equation of a circle in diametral form, Equation of Tangent and Normal at a point.(Simple problems) Parabola : Definition and equation of a parabola in standard form, Equation of Tangent and Normal at a point.(Simple problems) Ellipse and Hyperbola : Definition and equation in standard forms, Equation of Tangent and Normal at a point.(Simple problems)	8
	Total	35

Books Recommended :

- | | |
|--|----------------------------|
| 1. Mathematics XI & XII | by NCERT, New Delhi |
| 2. Mathematics XI & XII | by Rajasthan Board , Ajmer |
| 3. Coordinate Geometry | by Bhargava, Agrawal |
| 4. Algebra XII | by Bhargava, Agrawal |
| 5. Plane Trigonometry | by Bhargava, Agrawal |
| 6. Elements of Matrices and Determinants | by Sharma, Gokhroo, Saini |
| 7. Conic Section | by Gokhroo, Bhargava |
| 8. Coordinates Geometry | by RBD Publication |

Units	CONTENTS OF THE COURSE	Hours
I	Function : Definition, Domain, Codomain and Range of a function. Algebra of functions. Different kinds of functions. Concept of Limit, Left hand limit and Right hand limit, Limit of standard functions(Simple problems), Continuity and Differentiability at a point(Simple problems).	7
II	Differential Calculus : Derivative of Sum, Difference, Multiplication and Division of two functions, Differentiation of function of a function, Logarithmic differentiation, Differentiation of Implicit functions, Differentiation of Parametric functions, Differentiation by trigonometrical transformations, Differentiation of a function with respect to other function. Second order derivative.	7
III	Differential Calculus : Geometrical meaning of $\frac{dy}{dx}$. Tangents and Normals. Angle of intersection between two curves. Derivative as a Rate measurer , Errors and Approximations. Maxima and Minima of function with one variable.	6
IV	Integral Calculus : Integral as anti-derivative. Integration of Sum and Difference of functions. Integration by substitution, Integration by partial fractions, Integration by parts. Integration of Rational and irrational functions . Definite Intgral and its properties.	7
V	Differential Equations : Differential equations of first order and first degree : variable separable, homogeneous form , linear form, reducible to linear form, exact form , reducible to exact form. Linear differential equations of higher order with constant coefficients.	8
	Total	35

Books Recommended:

1. Mathematics XI & XII by NCERT, New Delhi
2. Mathematics XI & XII by Rajasthan Board , Ajmer
3. Differential Calculus by Bansal, Bhargava, Agrawal
4. Integral Calculus by Bansal, Bhargava, Agrawal
5. Elements of Differential Equations by Gokhroo, Saini, Agrawal
6. Differential Equations Vol. I by Bansal, Dhani
7. Differential Equations Vol. I by RBD Publication
8. Differential Calculus by RBD Publication

Units	CONTENTS OF THE COURSE	Hour
I	Force: Definition, Units and Different Types of Forces. Coplanar Forces: Resolution of Forces, Law of Parallelogram of Forces, Resultant of two or more Forces, Basic Conditions of Equilibrium, Lami's Theorem (No Proof), Jib Crane and Law of Polygon of Forces (Only Statement).	7
II	Moment: Definition, Units & Sign Convention, Principle of Moments, Application of Equilibrium Conditions for non-concurrent Forces. Application of Principles of Forces & Moments: Levers & their Types, Reactions of Simply Supported Beams (Graphical & Analytical Method), Steel Yard, Lever Safety Valve and Foundry Crane.	9
III	Centre of Gravity: Concept, Centroid, Calculation of C.G. of Regular Bodies and Calculation of C.G. of Plain Geometrical Figures. Friction: Types of Friction, Laws of Friction, Angle of Friction, Angle of Repose, Friction on Horizontal and Inclined Plains, Application of Laws of Friction Related to Wedge, Ladder and Screw Jack.	8
IV	Simple Machines: Basic Concepts, Loss in Friction, Inclined Plane, Simple & Differential Wheel and Axle (Neglecting Rope thickness), Screw Jack, Lifting Crabs, Systems of Pulleys, Worm and Worm Wheel. Rectilinear Motion: Concept, Motion under Constant Velocity, Motion under Constant Acceleration, Velocity-time graph and its uses.	8
V	Motion under Gravity: Concept, Vertical Motion, Smooth Inclined Plane. Projectiles: Concept, Range, Maximum Height and Time of Flight, Equation of Trajectory, Calculation of Velocity of Projectile at Certain Height And at Certain instant.	7

Books Recommended

1. Engineering Mechanics by Domkundwar & Domkundwar
2. Engineering Mechanics by D S Kumar
3. Engineering Mechanics by R K Rajput
4. Engineering Mechanics by R. Douglas Gregory
5. Engineering Mechanics by Bhattacharya

1. Introduction of Drawing Instruments.
2. Lines, Lettering and Dimensioning:
 - (a) Types of Line.
 - (b) Lettering – Single Stroke, Italics.
 - (c) Various Systems of Placing the Dimensions.
3. Geometrical Construction and Engineering Curves:
 - (a) 3.1 Regular Polygons of Given Side.
 - (b) 3.2 Conic sections – Construction of Ellipse, Parabola, Hyperbola.
 - (c) 3.3 Construction of Cycloid, Epicycloid and Hypocycloid.
 - (d) 3.4 Construction of Involute, Archimedian Spiral and Cylindrical Helix.
4. Scales:
 - (a) 4.1 Type of Scales (Reducing and Enlarging).
 - (b) 4.2 Representative Fraction.
 - (c) 4.3 Plain and Diagonal Scales.
5. Theory of Orthographic Projections :
 - (a) Introduction of Projections, Reference Planes and Projectors .
 - (b) Angle of Projections (First Angle and Third Angle Projections).
 - (c) System of Rotations.
 - (d) Projection of Points in Different Quadrants.
6. Projection of Lines :
 - (a) Parallel to Both the Planes.
 - (b) Parallel to One and Perpendicular to Other Planes.
 - (c) Parallel to One and Inclined to Other Planes.
 - (d) Inclined to Both the Planes.
 - (e) True Length of a Line and its Apparent and True Inclinations.
7. Projection of Planes :
 - (a) Projection of Triangular, Square, Rectangular, Pentagonal, Hexagonal and Circular Planes.
 - (b) Plane Parallel to One & Perpendicular to Other.
 - (c) Plane Perpendicular to Both the Planes.
 - (d) Plane Perpendicular to One and Inclined to Other Plane.
8. Projection of Solids :
 - (a) Projection of Cube, Prism, Pyramid, Cylinder and Cone.
 - (b) Projection of Solid whose Axis is Perpendicular to One and Parallel to Other plane.
 - (c) Projection of Solid Whose Axis is Parallel to One and Inclined to Other Plane.
 - (d) Projection of Solid Whose Axis is Parallel to both the Planes (excluding inclined to both the planes).
9. Conversion of Pictorial Views into Orthographic Views :
 - Orthographic Projections of Simple Solid Object from Pictorial / Isometric view.
10. Section of Solids and Development of Surfaces :
 - (a) Introduction of Sectional Planes.
 - (b) Sectional Plane Perpendicular to one Reference Plane and Parallel to other.
 - (c) Sectional Plane Perpendicular to one and Inclined to other.

- (d) Section of all types of Geometrical Solids. viz, Prism, Pyramid, Cone and Cylinder.
- (e) Apparent Section and True Section.
- (f) Development of Surfaces of Regular Solids viz, Prism, Pyramid, Cone and Cylinder.
- (g) Sectional Plan, Sectional Elevation and Sectional Side View and Development of Surface of Solid after Section.

Practicals:

1. Preparation of following on Imperial Size Drawing Sheet :-

	Practical
(a) Lines, Letters and Scales.	8
(b) Geometrical Constructions and Engineering Curves.	8
(c) Projection of Lines.	10
(d) Projection of Planes	6
(e) Projection of Solids	10
(f) Orthographic Projections of Simple objects	12
(g) Section and Development of Surfaces of Solids Cone, Cylinder, Sphere etc.	8

2. Preparation of following Drawings in Sketch Book (Home Assignment) :

- (a) Lettering (On Graph Sheet).
- (b) 2.2 Projection of Points In Different Quadrants.
- (c) 2.3 Isometric Projection of Various Planes.

REFERECE BOOKS:

1. Engineering Drawing N D Bhatt
2. Machine Drawing N D Bhatt
3. Engineering Graphics V. Laxmi Narayan
4. Machine Drawing V. Laxmi Narayan
5. Engineering Drawing P S Gill
6. Machine Drawing M L Mathur
7. Engineering Drawing (Hindi) B K Goyal
8. Mechanical Engineering Drawing (Hindi) Gupta & Kumar
9. Engineering Drawing A C Parkinson

1. Isometric Projection :
 - (a) Isometric Axes, Isometric Scale, Isometric Lines and Isometric Planes.
 - (b) Isometric View and Isometric Projection of Plane (Square, Rectangular, Pentagonal Hexagonal, Circular).
 - (c) Isometric View and Isometric Projection of Prism, Pyramid, Cone, Cylinder, Sphere, their Frustum and Combination of these Solids.
2. Sections and Conventions :
 - (a) Conventional Method of Representing Full, Half, Removed, Revolved, Partial and Offset Section.
 - (b) Section Lines for Different Material as per ISI Recommendations.
3. Rivets and Riveted Joints:
 - (a) Different Types of Rivets -Snap Head, Pan Head with Tapered Neck, Rounded Counter Sunk Head, Flat Counter Sunk Head.
 - (b) Lap Joint - Single Riveted, Double Riveted (Chain Riveting and Zigzag Riveting).
 - (c) Butt Joint - Single Riveted, Double Riveted Chain Riveting and Zigzag Riveting (using Single and Double Cover Plates).
4. Screw Threads and Fasteners:
 - (a) Classification of Threads.
 - (b) Profiles and uses of - Metric, BSW, Square, ACME, Knuckle, Sellers Threads.
 - (c) Machine Screw – Fillister, Flat Counter Sunk, Rounded Counter Sunk, Cup and Socket.
 - (d) Set Screws – Oval, Conical, Flat and Cup Pointed.
 - (e) Hexagonal Bolt and Nut, Stud and Collar Stud.
5. Foundation Bolt and Locking Devices:
 - (a) Drawing and uses of Rag, Lewis and Eye Bolt.
 - (b) Locking by Simple Lock Nut, Split Pin and Spring Washer, Castle Nut, Locking by Plate.
6. Keys and Pulleys:
 - (a) Drawing and uses of Various Types of Keys - Saddle Key - Hollow and Flat, Sunk - Rectangular, Square, Key with Gib Head, Woodruff Key.
 - (b) Pulley - Straight Arms flat Belt Pulley, V-Belt Pulley.

7. Shaft Couplings:
 - (a) Muff Coupling.
 - (b) Protected Type Flange Coupling.
8. Bearings:
 - Simple Bush Bearing.
9. Building Drawing:
 - (a) Introduction of Orientation and Sun Chart Diagram of Residential Building.
 - (b) Section of a Wall Including Foundation.
 - (c) Sectional Plan of One Room and Toilet from Given Sketch.

Practicals:

	Practical
1. Section and Development of Surfaces of Prism and	8
(a) Pyramids	
(b) Isometric Projections	10
(c) Riveted Joints.	6
(d) Screw Threads and Fasteners	8
(e) Pulleys	6
(f) Couplings	6
(g) Bearing	6
(h) Building Drawing	8
2. Preparation of following Drawings in Sketch Book (Home Assignment) :	
(a) Various Types of Rivet Heads	
(b) Section and Conventions	
(c) Set Screws	
(d) Machine Screws	
(e) Foundation Bolts, Key.	

REFERECE BOOKS:

1. Engineering Drawing N D Bhatt
2. Machine Drawing N D Bhatt
3. Engineering Graphics V. Laxmi Narayan
4. Machine Drawing V. Laxmi Narayan
5. Engineering Drawing P S Gill
6. Machine Drawing M L Mathur
7. Engineering Drawing (Hindi) B K Goyal
8. Mechanical Engineering Drawing (Hindi) Gupta & Kumar
9. Engineering Drawing A C Parkinson

CARPENTRY SHOP

Timber, definition, engineering applications, seasoning and preservation Plywood and ply boards. Measuring and Marking Tools, cutting tools used in carpentry & safety Measures.

List of jobs to be made in the Carpentry shop

1. T – Lap joint
2. Bridle joint

FOUNDRY SHOP

Moulding tools and Moulding Boxes and other requirements like furnace etc Moulding Sands, constituents and characteristics,

Pattern definition, materials types, core prints, Role of gate, runner, riser, core and chaplets, □ Causes and remedies of some common casting defects like blow holes, cavities, inclusions

List of jobs to be made in the Foundryshop

1. Mould of any pattern
2. Casting of any simple pattern

WELDING SHOP

Definition of welding, brazing and soldering processes and their applications

□ Oxyacetylene gas welding process, equipment and techniques, types of flames and their Applications. Manual metal arc welding technique and equipment, AC and DC welding Electrodes: Constituents and functions of electrode coating, welding positions

□ Types of welded joints, common welding defects such as cracks, undercutting, slag inclusion and boring

List of jobs to be made in the Weldingshop

1. Gas welding practice by students on mild steel flat
2. Lap joint by gas welding
3. MMA welding practice by students
4. Square butt joint by MMA welding
5. Lap joint by MMA welding
6. Demonstration of brazing

SHEET METAL SHOP

Name, Functions & Specification of common Sheet Metal Tools like Slakes, Hammes, Hard Sstrips, Purchase, Groovers, and Rivet Sets.

List of jobs to be made in the Sheet Metal.

Joints:

1. Single & Double Hem Joints
2. Wire Edge
3. Lap Joint
4. Utility Jobs

FITTING AND SMITHY SHOP

Files, materials and classification. Specification files use of Marking & Measuring Tools.

Forging, forging principle, materials, Operations like drawing, upsetting, bending and forge welding, □ Use of forged parts. List of tools used in Marking & Measuring for

Smithy Shop.

List of jobs to be made in the Fitting And Smithy Shop

1. Finishing of two sides of a square piece by filing
2. Tin smithy for making mechanical joint and soldering of joint
3. To cut a square notch using hacksaw and to drill three holes on PCD and tapping
4. Job Preparation in forging shop involving basic operations.

PLUMBING SHOP

Classification of pipes according to Material and use of I.S.I. specification of pipes.

Introduction to cement & PVC Pipes: and their uses.

List of Tools & Equipment used in Plumbing Shop

5. Cutting & Trending on G.I. Pipe
6. Exercises on PVC Pipe Fitting
7. Repair of Taps & Cocks

List of Recommended Books:-

1. Workshop Technology and Practice By Hazara Chowdhary Vol I & Vol II
2. Workshop Technology and Practice By B.S. Raghuvanshi
3. Workshop Technology By : Chapman Vol I ,II & III
4. Workshop Technology (Hindi) Tahil
5. Workshop Technology (Hindi) Machnani
6. Domestic Devises & Application by KB Bhala

Unit	CONTENTS OF THE COURSE	Hours
I	Computer: An Introduction Generation of Computers & Types : PC, PC/XT, PC/AT, Main Frame, Super, Lap Top, Pam Top, Data representation Bit, Nibble, Byte, Word Number System : Decimal, Binary, Hexadecimal & their Conversions, Arithmetic Operations, Binary Number System, 1s, 2s Compliment, Coding Technique : BCD, EBCDIC, ASCII, Hardware, Software, Firmware, Free ware, Human ware Computer Languages and Translators: Machine, Assembly, High Level Language, Scripting Language, Object Oriented Language, Platform Independent Language, Translators: Assembler, Interpreter, Compiler.	7
II	Introduction to Computer: Central Processing Unit (CPU) Memory Unit, Input/ Out Devices : Keyboard, Mouse (Optical), Digitizer, Scanner, Camera, Monitor (CRT, TFT) , Printers, Plotters, Bar Code Reader , Secondary Storage Devices : Floppy, Hard Disk, CD, DVD, Flash Drive, Block Diagram Showing Interconnection of Computer Parts Operating System : Definition of Operating System (OS) , Types of OS Single user, Multi user, Multi Programming , Time Sharing , Multi Processing	7
III	Introduction to Windows XP: 7: Introduction to Windows Environment , Parts of Windows Screen Icon, Menu, Start Menu , Minimising, Maximising, Closing Windows Windows Explorer, Recycle Bin, Clipboard, My Computer, My Network Places, Control Panel : Adding New Hardware and Software, Display, Font, Multimedia, Mouse, International System , Accessories: Paint, Media Player, Scan disk, System Information.	7
IV	Information Concepts and Processing: Definition of Data, Information, Need of Information, Quality of Information , Concepts of Data Security, Privacy, Protection Computer Virus and their types, Scanning & Removing Virus , Computer and Communication: Need of Data Transmission Data Transmission Media, Baud rate and Bandwidth, Digital and Analog Transmission , Serial and Parallel Data Transfer, Protocols, MODEM. Networking of Computers : LAN, WAN, MAN, Blue tooth , Topologies: Bus, Star, Ring, Hybrid, Introduction to Ports : RS232, IEEE 488, PS2, USB, UTP.	7
V	Information Processing: Word processor, Introduction to MS-Word , Starting MS-Word Special Features of MS-Word , Using Help , Opening Document, Typing and Editing , Copying, Inserting, Moving, Deleting Copying from One Document to Others , Undo, Redo, Spell Check, Find and Replace , Formatting , Characters and Fonts , Spacing Removing Characters Formatting , Inserting Symbols Paragraphs. Page Setting , Auto text and Auto Correct , Introduction to Macro , Electronic Spread Sheet , Power Point: Introduction to Power Point , Creating a Presentation/Slide , Adding Animation in Slide Running a Slide Show.	8
	Total	36

REFERECE BOOKS :

1. Computer Fundamental V.K. Jain, Standard Pub. & Distributors
2. PC Software for Windows made simple R.K. Taxali, TMH
3. Mastering Windows XP TMH
4. BPB Computer Course BPB Editorial Board, BPB in Hindi
5. Introduction to Networking NANCE, PHI
6. First Course in Computer Science Sanjeev Saxena, Vikas Publishing House
7. First Look Microsoft Office 2003 Murray, PHI
8. Web Based Application Development Ivan Beyross, TMH using HTML, DHTML, Javascript Pearl/ CGI

S.NO	CONTENT	HOURS
1	Study of Computer Components Practice of Computer Booting Process in XP	2
2	Practice of using My Computer, Windows Explorer, Practice of using Control Panel, Practice of My Network Places	2
3	Practice of CD and DVD Writing	2
4	Practice of Paint, Installation of Windows XP by using NTFS File System, Demonstration of Network	2
5	Visit to Internet Site	2
6	Creating e-mail Account , Sending and Receiving e-mails	2
7	Sending e-mail with Attachment & Signature, Searching Web Page/ Site using Search Engine	2
8	Exercise Based on MS-Word: Exercise Based on Power Point : Creating Slide	2
9	Exercise Based on Ms-Excel :	2
10	Exercise Based on Power Point :	2

References Books :

1. Computer Fundamental V.K. Jain, Standard Pub. & Distributors.
2. PC Software for Windows made simple R.K. Taxali, TMH.
3. Mastering Windows XP TMH.
4. BPB Computer Course BPB Editorial Board,BPB in Hindi .
5. Introduction to Networking NANCE, PHI.
6. First Course in Computer Science Sanjeev Saxena, Vikas Publishing House.
7. First Look Microsoft Office 2003 Murray, PHI.
8. Web Based Application Development Ivan Beyross, TMH using HTML, DHTML, Javascript Pearl/ CGI.

A - ELECTRICAL LAB**P**

- | | |
|---|---|
| 1. Study of Symbol, Specification and Approximate Cost of Common Electrical Accessories, Tools and Wires & Cables Required for Domestic Installation. | 4 |
| 2. Study of : | 2 |
| (a) Basic Electricity Rules for a Domestic Consumer | |
| (b) Safety Precautions & use of Fire Fighting Equipments | |
| 3. Use of series of Phase Tester, Series Test Lamp, Tong Tester and Megger in Testing of Electrical Installation. | 2 |
| 4. Prepare a Potential Divider and Measure Resistance of a Filament Lamp Using Voltmeter and Ammeter. | 2 |
| 5. Measurement of Power and Energy Consumption by an Electric Heater using Watt Meter and Energy Meter. | |
| 5. Preparation of Wiring Diagram, Wiring, Testing, Fault Finding & Costing for : | 6 |
| (a) Control of one Lamp by one Switch (using Batten and Tumbler Switch) | |
| (b) Control of Stair Case Wiring (using Casing Capping, CFL and Flush Type Switches) | |
| 6. Control of one Bell Buzzer and Indicator by one Switch (using Conduit and Flush type Switch) | |
| 7. Prepare one Switch Board as per Institutional Requirement (using Flush type Switches, Sockets, MCB, ELCB, Etc.) | 2 |
| 8. Study, Connecting, Testing and Fault Finding of Fluorescent Tube and its Accessories | |
| 9. Ceiling Fan with resistance type and Electronic Regulator | |
| 10. Study, Functioning, Fault Finding & Repairing of following Domestic Appliances - | 4 |
| (a) Automatic Electric Iron | |
| (b) Air Cooler | |
| (c) Electric Water Pump | |
| 11. Design, Draw and Estimate the Material required for Installation For a small Residential Building/ Office/ Hall. | 4 |

* Accessories used in all above Experiments must be According to Latest Technology.

B - ELECTROICS LAB	P
1. Identification of following Resistors and finding their Values:	2
(a) Carbon and Metal Film	
(b) Variable Resistance Log and Linear	
(c) Semi Variable Preset of One Turn & Multiturn	
2. Identification of following Capacitor and finding their Values:	2
(a) Mica	
(b) Ceramic	
(c) Polysterene	
(d) Electrolytic	
(e) Tantalum	
3. Identification of following Switches and Study of their Working Mechanism:	2
(a) Toggel	
(b) Bandswitkeh	
(c) Rotary	
(d) Push to on and off	
(e) Press to on and off	
4. Identification and Testing of following type of Connectors:	2
(a) Rack and Panel	
(b) Printed Circuit Edge	
(c) Coaxial	
(d) Tape & Ribbon	
(e) Plate	
5. Study of Different Relays and their Contacts.	2
6. Study of following Tools used in Electronic Workshop:	2
(a) Component Lead Cutter	
(b) Wire Strippers	
(c) Soldering Iron & Soldering Station	
(d) De-Solder Pump	
7.Measurement of Voltage, Current and Resistance using Analog& Digital Multimeter.	2
8.Testing of Electronic, Component such as Capacitor, Inductor,Diode and Transistor.	2
9. Measurement of Amplitude & Frequency of a Signal using CRO.	4
10. Verification of Ohm's law using Resistive Circuit and Analog Meters.	4
11. Soldering of different passive component combination on general purpose PCB.	4
12. Sketching of different Electronic Components Symbol on Drawing Sheet.	2

References Books :

1. Electrical Workshop M.L. Gupta.
2. Domestic Devices & Appliances K.B. Bhatia.
3. Electrical Workshop S.L. Uppal.
4. Electrical Component & Shop Practice K.R. Nahar.
5. Maintenance of Electrical Equipments K. S. Janwal.
6. Hand Book of Philips Component.