2.1 COMMUNICATING EFFECTIVELY IN ENGLISH
II SEMESTER SYLLABUS

L T P
3 - 2

RATIONALE

Interpersonal communication is a natural and necessary part of organizational life. Yet communicating effectively can be challenging because of our inherent nature to assume, overreact to and misperceive what actually is happening. Poor or lack of communication is often cited as the cause of conflict and poor teamwork. In today's team-oriented workplace, managing communication and developing strategies for creating shared meaning are crucial to achieving results and creating successful organizations. The goal of the ***Communicating Effectively in English*** course is to produce civic-minded, competent communicators. To that end, students must demonstrate oral as well as written communication proficiency. These include organizational and interpersonal communication, public address and performance.

II SEMESTER 48 hrs

1. LISTENING COMPREHENSION 4hrs

1.1 Locating Main Ideas in a Listening Excerpt
1.2 Note-taking

2. ORAL COMMUNICATION SKILLS 14 hrs

2.1 Offering-Responding to Offers
2.2 Requesting-Responding to Requests
2.3 Congratulating
2.4 Expressing Sympathy and Condolences
2.5 Expressing Disappointments
2.6 Asking Questions-Polite Responses
2.7 Apologizing, Forgiving
2.8 Complaining
2.9 Persuading
2.10 Warning
2.11 Asking for and Giving Information
2.12 Giving Instructions
2.13 Getting and Giving Permission
2.14 Asking For and Giving Opinions

3. GRAMMAR AND USAGE **10hrs**

3.1 Prepositions
3.2 Pronouns
3.3 Determiners
3.4 Conjunctions
3.5 Question and Question Tag
3.6 Tenses (Simple Present, Simple Past)

*One chapter revising the topics discussed during the first semester. (Punctuation, Articles, Framing questions, Verbs, Word formation)

4. WRITING SKILLS **10hrs**

4.1 Writing Notice
4.2 Writing Circular
4.3 Writing a Memo
4.4 Agenda for a Meeting
4.5 Minutes of the Meeting
4.6 Telephonic Messages

* Writing a paragraph will be a continuous exercise through out the session. (Writing will be based on verbal stimuli, tables and graphs.)

5. READING SKILLS **10hrs**

5.1 Vocabulary Enhancement
5.2 Techniques of reading: Skimming, Scanning, Intensive and Extensive Reading

NOTE: The Reading Skills of the learners (along with vocabulary enhancement) will be through reading thematic articles/essays and/or stories.

CONTENTS

Reading Skills

Writing Skills

Grammar and Usage

2.2 ARCHITECTURAL DRAWING -II

L	T	P
-	-	6

RATIONALE

Free hand, sketching, colouring and rendering like sketching, shades and shadows, lettering and printing forms important components of Architecture discipline. Graphic presentation forms a core subject for preparing perspective drawings, scale drawings, three dimensional views, furniture drawings and layouts. Therefore, this course aims at equipping the students with the skills of graphic presentation and other above mentioned areas.

Teachers are expected to lay considerable stress on practical work so that students attain sufficient skills for preparing good quality perspective of interior and exterior of buildings

Teachers are also expected to stress upon appropriate line work, properties, dimensioning lettering and printing.

DETAILED CONTENTS

1. Reviewing orthographic projections (plans, line projections, solids) (1 sheet)

2. Section of Solids (4 sheets)
   Simple geometrical shapes e.g. cube: Elementary building sections Highlighting line intensities for sectional and elevational components. (example: parapet, chajjas in section and elevation behind)

3. Development of surface (1 sheet)
   Development with an aim to calculate areas if required

4. Isometric Views (3 sheets)
   Conversion of 2D geometrical shapes into 3D isometric views (30^o – 30^o) to realize the potential of each from simple to complex solid to basic building forms

5. Axonometric Views (5 sheets)
   Conversion of 2D geometrical shapes into 3D axosometric views at different angles (45^o – 45^o, 30^o – 60^o) to realize the potential of each from simple to complex solid to basic building forms. Isometric/axonometric use of any building form, from a given base plan – to be developed as per the student's imagination of the exterior/interior components (with roads, landscape elements)

Note: Total No. of minimum sheets = 14

2.3 HISTORY OF ARCHITECTURE-1

L	T	P
3	-	-

RATIONALE

The course on History of Architecture develops appreciation regarding past and current trends in the field of architecture. The knowledge of this course will help the students to understand how political, physical, social, economical and technological change affect the architecture, materials and construction techniques. The course covers broad topics like: pre-historic architecture, important civilizations, (Indian, Egyptian, Greek and Roman), medieval architecture in Europe, and temple architecture and Budhish architecture in India.

The teacher should try to create interest among the students for this course by organizing site visits to the local old monuments. Audio-visual aids should also be used to explain various architectural developments. While imparting instructions, teacher should stress upon the context of form and space, construction methods structural systems and materials. The teacher should motivate the students to take general reference for form, drawings structural solutions and materials from the history, while designing their project.

DETAILED CONTENTS

1. Pre Historical Architecture and Introduction to History of Architecture (6 Hrs)

   1.1 Importance of history to understand the Architecture.

   1.2 Examples of Early shelters, Stone Age, Tumuli, etc. as expression of man's physical and spiritual needs.

   1.3 Determinants of built form – geo physical, societal, technological etc. (Early caves, timber huts, stone houses etc).

2. Western Civilization (8 Hrs)

   2.1 Egyptian Civilization Concept of the Royal Necropolis, locational context and architectural characteristics of public buildings, e.g. Mastabas (master of sakara) pyramids and temples (rock – cut and structural) – one example of each type to be chosen.

   Mesopotamian Civilization the urban context and architecture of public buildings (Ziggurats and palaces) - one example of each.

3. Greek Civilization (8 hrs)

3.1 Greek towns, location and characteristics of typical civic spaces such as Agora, Acropolis, Theatres etc.

3.2 Significant characteristics of Greek Architecture such as Materials, construction systems, system of proportioning, Greek orders, architecture of Greek temples – Parthenon, Athens.

4. Roman Civilization (8 hrs)

4.1 Significant characteristics of Roman Architecture. Concept of monumentality, materials and construction systems, Roman orders.

4.2 Building analysis – Colosseum, Thermal, Basilicas, Pantheon Rome, The Roman villa – their form, scale and constructional/structural systems.

5. Indian Civilization (10 Hrs)

5.1 Indus Valley Civilization: Form of the Hardpan city, location and role of public buildings.

5.2 Architecture of the typical Harappan dwelling, Granary and Bath.

5.3 The Vedic Village, building typology and construction.

6. Buddhist Architecture in India (8 Hrs)

6.1 Buddhist settlements in India, factors in selection of sites of Buddhist architecture.

6.2 Building typology – stupas, Chaityas and Viharas - suitable examples from each; geographical context to illustrate differences in form, construction methods and ornamentation.

Note:

While imparting instructions wherever possible, in this subject, the teachers should organize site visits to the old monuments and buildings with extra-ordinary architectural features. Experts/Guides should be invited to deliver lectures on the relevant themes in order to generate interest in the students. Audio-visual materials available on the subject, in the country and abroad, be procured and presented to the students from time to time to enrich the quality of classroom instructions. Special architectural features of some old/

historical famous Indian and International buildings may be presented to the students as case studies. Students may be encouraged to prepare case studies of at least one famous old/historical building. The teachers and students may visit web sites, relevant to the history of architecture.

RECOMMENDED BOOKS

1. History of Architecture by Sir Banister Fletcher

2. Indian Architecture (Hindu Period) by Parcey Brown

3. Indian Architect ate (Hindu and Buddhist Period) by Satish Grover

4. Encyclopedia of Architecture.

2.4 BUILDING CONSTRUCTION - I

L	T	P
2	-	4

RATIONALE

The aim is to develop an understanding of the behaviour and function of various components of buildings. For this it is essential that the student are taught the various components of building such as foundations, floors, super structure, joints, opening, roofs etc. The first year timber construction and RCC will be dealt with.

Teachers must supplement their lectures with models, audio-visuals and on site study of various building components.

For drawing work, stress must be laid on scale, dimensioning, lettering, and composition of the drawing.

At the end of the first year, the students should be able to draw a complete vertical section through a simple single storied flat roof building.

The subject teacher shall introduce the theory component of the topic to the students before drawing sheets are attempted by the students.

DETAILED CONTENTS

Note: The theoretical constructions should be imparted to the students along with building construction drawings

1. Masonry Construction

   1.1 Brick work (1 sheet)
   - Study of standard brick (FPS and MKS system) its dimensions
   - Brick moulding and manufacturing technique in a brick kiln
   - Specially formed bricks

   1.2 Brick work in Foundation (1 sheet)
   Trenching concrete bedding and brick work in Section and Plan.

   1.3 Stone work (1 sheet)
   Various types of stones used for masonry work with special reference to locally available stone. Exposure to cutting of stones and their finishing. Classification of stone masonry.

   1.4 DPC (1 sheet)
   - Sources of dampness and effects of dampness
   - Treatment of building components for effective damp proofing

1.5 Brick work in super structure (Different Bonds) (1 sheet)

1.6 Openings in Walls (2 sheets)

1.7 Classification of Arches and Lintels (2 sheets)

2. Joinery (1 sheet)

2.1 Doors and windows frames – their fixing

3. Flooring (1 sheet)

3.1 Types of flooring and constituents (ground and upper flooring)

3.2 Different types of floor finishes

Note: Total minimum 11 sheets

RECOMMENDED BOOKS

1. Building Construction by Sushil Kumar

2. Building Construction Vol. I, II, III and IV by WB Mackay

3. Building Drawing by Srah

4. Building Construction Illustrated by DK Chung

5. Advanced Building Construction by Mitchell

2.5 BUILDING MATERIALS-II

L	T	P
3	-	-

RATIONALE

Diploma holders in Architectural Assistantship are supposed to prepare working drawings of buildings. Knowledge of building materials is very essential from the point of construction for providing detailed specifications in the working drawings. Therefore, the course in building materials includes imparting basic knowledge in the properties and use of the basic materials like: stones, bricks, lime, cement, paints, timber, exterior and interior finishes, glass, plastics, building hardware, roofing materials, additives and admixtures, adhesives etc.

Teachers are expected to demonstrate the samples of different materials, discuss their properties with particular reference to their use and appearance in particular situations depending upon climate and environmental conditions of the site, where the materials are to be used. Students should be encouraged to collect samples of various materials and efforts should be made to maintain a good building material museum.

DETAILED CONTENTS

NOTE: The students are also expected to go through Architecture Journals like inside – Outside, Interiors today, Design and Interiors, Architect and builder, Builders Friend etc. They should make scrapbook of relevant brochures.

1. Floor Finishes (Laying sizes, availability, popular brand names, quality of polish, uses and current market rates) (4 hrs)
   - *f* Terrazzo Tiles and Flooring
   - *f* Glazed terracotta and ceramic tiles
   - *f* Cement Concrete Tiles
   - *f* Marble stone, Kota stone, slate, red sand stone, granite – their tiles and slabs
   - *f* Parquet (Wooden)
   - *f* Linoleum tiles and rolls
   - *f* PVC
   - *f* Heavy duty flooring for industrial building

2. Wall Finishes (along with application method) (6 hrs)
   - *f* Wall board homogeneous
   - *f* Laminated fiber boards – types
   - *f* Plastic wall tiles – tiles available
   - *f* Wall papers
   - *f* Cork sheets and tiles
   - *f* Thermocoal

- *f* Foam rubber tiles and rolls
- *f* Textured paint finishes

3. Ceiling Materials (Size, quality, their availability, types of finishes, uses, trade names, market rate and application methods. (6 hrs)
   - *f* Hession cloth
   - *f* Gypsum plaster boards plaster of Paris board
   - *f* Plain AC sheets – E board etc.
   - *f* Plywood
   - *f* Hard Board
   - *f* Cellotex
   - *f* Fibre Boards
   - *f* Fibre glass
   - *f* Asbestos tiles
   - *f* Thermocoal
   - *f* Medium density fibre board (MDF)

4. Building hardware (sizes, applications) (4 hrs)

   Note: Teacher may show these items to the students in material museum maintained by the department/market survey.
   - *f* Tower bolts
   - *f* Hinges including concealed hinges
   - *f* Door Handles
   - *f* Door springs
   - *f* Latches
   - *f* Floor door stopper/floor springs and magnetic types stoppers
   - *f* Fan light pivots
   - *f* Mortice lock
   - *f* Door closer – including hydraulic types
   - *f* Ventilator chains
   - *f* Wire gauze
   - *f* Magnetic cupboard closers

5. Application of Glass (along with Brief manufacturing process and brand names in the market with comparative prices (4 hrs)

   The uses of different types of glass in the building interiors e.g.:
   - *f* Etched glass
   - *f* Painted glass
   - *f* Stained glass
   - *f* Glass bricks : usage in partition walls and roofing
   - *f* Mirrors
   - *f* General glazing
   - *f* Facades

6. Roofing Materials (6 hrs)

- Asbestos sheets
- GI sheets
- Shingles
- Ferro-cement sheets
- Fibre sheets
- Slates
- Manglore tiles
- Pan tiles
- Corrugated PVC sheets

Their standard sizes, uses, availability, prices and knowledge about supporting system

7. Additives and Admixtures (4 hrs)

- Water repellants and water proofing agents
- Accelerators
- Air entraining agents
- Hardners
- Workability increasing agents
- Fly ash

Their availability, uses, costs, performance specifications, and properties used under various conditions.

8. Adhesives (2 hrs)

Synthetic resins (their trade names, uses of synthetic resins, costs, application in various situations as compared to traditional materials and methods)

9. Kitchen and Toilet Fixtures (6 hrs)

Market survey of various materials and collection of data with reference to their properties, sizes, costs, designs etc. (Specifications of kitchen and toilet fittings and fixtures, their popular brand names, shapes and sizes).

Note: Sizes, specifications and availability of sanitary fittings e.g. W.C/ Cisterns/Urinals/Wash basins/Kitchen sinks, related accessories their types, brands and costs.

10. Paints (6 hrs)

(Packing sizes, rates, brands, performance guarantees as given by the manufacturer and collection of catalogues and their covering capacity, uses and availability

- Water based paints
- Distempers

- Oil based paints and emulsions
- Cement paints
- Acrylic emulsions
- Melamine finishes
- Varnishes
- Spirit polish, wax polish
- Lacquers
- Stucco
- Tar and Bitumen paint
- Glazing putty

Note: The study should be supported by market survey of materials with brands, sizes, rates and availability. An exercise should be conducted to take the students to building material exhibitions and make them aware of new materials being launched in market and let them prepare a brief report on the application of new materials and understand how to chose a material for a specific purpose after evaluating its availability, cost, performance and elegance etc.

Teachers should demonstrate samples of various materials while imparting classroom instruction. Teachers may also arrange some field visits to manufacturing production units and retailer shops like cement, kilns, timber saw mills and seasoning plants, hardware shops, glass houses etc. Students should be encouraged to collect samples of various materials and catalogues of manufacturer. The students may maintain a scrapbook for this purpose. A museum of building construction, materials may be developed where samples of latest materials their specifications, characteristics, rates availability (supplier and relevant codes may be kept) to enhance to level of understanding of the students. The application of various materials should be shown to students in various buildings of importance, as reference

RECOMMENDED BOOKS

1) Sharma, SK; and Mathur, GC; "Engineering Materials;" Delhi-Jalandhar, R. Chand and Co.
2) Surendra Singh; "Engineering Materials;" New Delhi, Vikas Publishing House Pvt. Ltd.
3) Chowdhuri, N; "Engineering Materials;" Calcutta, Technical Publishers of India.
4) Bahl, SK; "Engineering Materials;" Delhi, Rainbow Book Co.
5) TTTI, Chandigarh "Civil Engineering Materials:" Tata McGraw Hill Publication
6) Kulkarni, GJ; "Engineering Materials;" Ahmedabad, Ahmedabad Book Depot.
7) Shahane; Engineering Materials; Poona, Allied Book Stall.
8) Gurcharan Singh; Engineering materials, Standard Publishers Distributors
9) Floor Finishes: (Laying, sizes available, popular brand names, quality of polish and uses of current market rates)

2.6 MODEL MAKING-II

L	T	P
-	-	4

RATIONALE

Students of Architectural Assistantship at diploma level are expected to assist in the preparation of architectural models of various kinds in their professional career. This skill can also form a basis of self-employment. Architecture models as three-dimensional representations are made in different mediums. The students should be acquainted with all of these mediums/materials

DETAILED CONTENTS

1. Block models of basic geometrical shapes like prisms, pyramids, cube, cone and cylinder using following materials :

    1.1 Handmade/ivory sheet
    1.2 Thermocole
    1.3 Mount board

    Composition of various geometrical shapes (in different colours and textures)

2. Sculpture making

    2.1 Plaster of Paris
    2.2 Clay modeling

3. Brick masonry

    3.1 Laying of bricks in different bonds

4. Models of details grill, gate, jalli and railing

2.7 ARCHITECTURAL DESIGN - I

L	T	P
-	-	6

RATIONALE

Diploma holders in Architectural Assistantship find employment with private architects and also majority of them go for self-employment. Therefore, they are required to develop aptitude/skills to design residential, commercial and other public buildings.

Teachers while imparting instructions/giving assignments to students are expecting to teach various elements of design like form function, balance, light of shadow, shape, plane, volume, line, rhythm, proportions, textures and other such related elements. Teachers are also expected to show various types of designs of small building to develop and appreciation for this subject.

Teachers should also motivate students to maintain sketch book/portfolio of all the assignments given to the students.

DETAILED CONTENTS

The subjects include the elements of Anthropometrics with respect to:

a) Human body
b) Various activities and human body
c) Furniture and fitting (standards)
d) Vehicles (all angles movement, parking, turning, sizes etc)
e) Street furniture

Note: a) All dimensions in all segments to be related to human figures.
b) Dimensions should be resolved from actual measurements.
c) Minimum of 10 sheets should be made in the semester

1. Proportion of Components of Human Body (1 sheet)
   The proportions of the different components of the human body; Examples from Le Corbusier Modular Man, Vitruvius Marco Pollione, Vastu Pursha Mandala

2. Human Activities 2 sheets)
   Requirement of space (2-D, 3-D) for various human activities (Single and multiple use of spaces such as queues etc.)

3. Furniture Standards (2 sheets)
   Furniture standards (sizes of domestic and public furniture); Toilet and Kitchen equipment - sizes and standards; Doors and windows - sizes, standards and locations.

4. Vehicles (1 sheet)
Vehicles in motion, parking along with turning radii for two-wheelers, cars, buses, vans etc. Standard road width.

5. Street furniture (3 sheets)

Standards for drinking fountains, waiting queues at bus stops, garden seats, waste bins, telephone booths, street lights, foot paths, public walkways, railing etc.

6. Graphic Representation of plant material (ground cover, foliage, shrubs, trees) human figures and vehicles. (2 sheets)

Note: While imparting instruction, special visits may be arranged to demonstrate and explain important architectural features of different types of residential, commercial and public buildings. Practicing architects may be invited from time to time to present case studies and to deliver expert lectures on important elements like form, function, balance, light of shadow, shape, plane, volume, line, rythem, proportions, textures and other such element appropriate to various designs. Teacher may present some of the already completed design works of practicing architects to the students and explain the important features and elements. Audio-visual material available in this field may be procured and presented to the students from time to time. Students should be encouraged to visit relevant web-sites and teachers should develop the design problems/assignments which can be taken up by the students using relevant and appropriate software. Students should be given group and independent design/drawing assignments and they should also maintain sketch book/portfolio of all the assignments given to them throughout the session. Teachers may conduct viva-voce on completion of each assignment. Students may present seminars towards the end of the session.

Total No. of Sheets = 11

RECOMMENDED BOOKS

1. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera

2. Architects Data by Neufert

3. Space, Time and Order by DK Ching

2.8 GENERAL WORKSHOP PRACTICE – I & II

RATIONAL

Manual abilities to handle engineering materials with hand tools need to be developed in the students. They will be using different types of tools/equipment in different shops for fabrication purposes. Besides developing the necessary skills, the students will appreciate the importance of quality and safety measures.

DETAILED CONTENTS

Note: 1. The students are supposed to come in proper workshop dress prescribed by the institute. Wearing shoes in the workshop(s) is compulsory. Importance of safety and cleanliness, safety measures and upkeep of tools, equipment and environment in each of the following shops should be explained and practiced. The students should prepare sketches of various tools/jobs in their practical Notebook.

2. The shops to be offered in I and II semester may be decided at polytechnic level

3. The students should be taken to various shops (not included in the curriculum) in the polytechnic in batches and should be given knowledge of the various machines/equipment. Such as machine shop, foundry shop, sheet metal shop, etc.

4. Students of Diploma in Chemical Engineering will undergo Shops 1 to 6 only

Following seven shops are being proposed:

1. **Carpentry shop**
2. **Fitting and plumbing shop**
3. **Welding shop**
4. **Paint shop**
5. **Forging and sheet metal shop**
6. **Electric shop**
7. **Electronics Shop**

1. Carpentry Shop

1.1 Introduction to various types of wood, carpentry tools - their identification with sketches. Different types of wood joints.

1.2 Simple operations viz. hand sawing, marking, planning

1.3 Introduction and sharpening of wood working tools and practice of proper adjustment of tools

1.4 Demonstration and use of wood working machines i.e. band saw, circular saw, rip saw, bow saw and trammels. Universal wood working machine and wood turning lathe

1.5 Making of various joints (Also draw the sketches of various wooden joints in the Practical Note Book)

a) Cross lap joint
b) T-lap joint
c) Corner lap joint
d) Mortise and tenon joint e) Dovetail joint
f) Prepare a file handle or any utility items by wood turning lathe

2. Fitting and Plumbing Shop

2.1. Introduction to fitting shop, common materials used in fitting shop, description and demonstration of various types of work-holding devices and surface plate, V-block

2.2 Demonstration and use of simple operation of hack-sawing, demonstration of various types of blades and their uses

2.3 Demonstrate and use of all important fitting shop tools with the help of neat sketches (files, punch, hammer, scraper, taps and dyes etc.)

2.4 Introduction of chipping, demonstration on chipping and its applications.

Demonstration and function of chipping tools.

2.5 Description, demonstration and practice of simple operation of hack saw, straight and angular cutting.

2.6 Demonstrations, description and use of various types of blades - their uses and method of fitting the blade.

2.7 Introduction and use of measuring tools used in fitting shop like: Try square, Steel rule, Measuring Tape, Outside micrometer, Vernier Caliper and Vernier Height Gauge

2.8 Description, demonstration and practice of thread cutting using taps and dies

2.9 Plumbing: Descriptions and drawing of various plumbing shop tools, Safety precautions. Introduction and demonstration of pipe dies, Pipe holding devices, Demonstration and practice of Pipe Fittings such as Sockets, Elbow, Tee, Reducer, Nipple, Union coupling, plug, Bend, Float valves and Taps

Job: Cutting and filing practice on a square of 45 X 45 mm^2 from MS flat

Job: Angular cutting practice of 45^0 (on the above job)

Job: Preparation of stud (to cut external threads) with the help of dies (mm or BSW)

Job: Drilling, counter drilling and internal thread cutting with Taps

Job: H-Fitting in Mild steel (ms) square

Job: Pipe cutting practice and thread cutting on GI Pipe with pipe dies

3. Welding Shop

3.1 Introduction to welding, type of welding, common materials that can be welded, introduction to gas welding equipment, types of flame, adjustment of flame, applications of gas welding. Welding tools and safety precautions

3.2 Introduction to electric arc welding (AC and DC), practice in setting current and voltage for striking proper arc, precautions while using electric arc welding. Applications of arc welding. Introduction to polarity and their use

3.3 Introduction to brazing process, filler material and fluxes; applications of brazing. Use of solder. Introduction of soldering materials

3.4 Demonstrate and use of the different tools used in the welding shop with sketches. Hand shield, helmet, clipping hammer, gloves, welding lead, connectors, apron, goggles etc.

3.5 Demonstration of welding defects and Various types of joints and end preparation

Job: Preparation of cap joint by arc welding

Job: Preparation of Tee joint by arc welding

Job: Preparation of single V or double V butt joint by using Electric arc welding

Job: Brazing Practice. Use of Speltor (on MS sheet pieces) Job: Gas welding practice on worn-out and broken parts

4. Paint Shop

Introduction of painting shop and necessity. Different types of paints. Introduction of powder coating plant and their uses.

Job: Preparation of surface before painting such as cleaning, sanding, putty, procedure and application of primer coat, and painting steel item.
Job: Painting practice by brush on MS sheet
Job: Practice of dip painting
Job: Practice of lettering: Name plates / Sign board
Job: Polishing and painting on wooden and metallic surfaces
Job: Practical demonstration of powder coating

5. Forging and sheet metal shop

Introduction to forging, forging tools, tongs, blowers/pressure blowers, hammers, chisels, punch, anvil, swag-block etc. Forging operations.

5.1 Forge a L hook or Ring from MS rod 6 mm φ

5.2 Forge a chisel and give an idea of hardening and tempering

5.3 Lap joint with forge welding

5.4 High Strength Steel (HSS) tools – forging of Lathe shaper tools like side-tools and V-shape tools

5.5 Making sheet metal joints

5.6 Making sheet metal trey or a funnel or a computer chassis

5.7 Preparation of sheet metal jobs involving rolling, shearing, creasing, bending and cornering

5.8 Prepare a lap riveting joint of sheet metal pieces

6. Electric Shop

6.1 Demonstration of tools commonly used in Electric Shop

6.2 Safety precautions , electric shock treatment

6.3 Demonstration of Common Electric material like: wires, fuses, ceiling roses, battens, cleats and allied items

6.4 Demonstration of Voltmeter, Ammeter, Multimeter and Energy meter

Job: Wiring practice in batten wiring, plastic casing-capping and conduit
Job: Control of one lamp by one switch Job: Control of one lamp by two switches Job: Control of one bell by one switch Job: Assemble a Tube light
Job: Dismantle, study, find out fault, repair the fault, assemble and test domestic appliances like electric iron, electric mixer, ceiling and table fan, tube-light, water heater (geyser) and desert cooler
Job: Laying out of complete wiring of a house (Single-phase and Three- phase)

7. Electronics Shop

7.1 Identification, familiarization, demonstration and use of the following electronic instruments:

a) Multi-meter digital
b) Single beam simple CRO , function of every knob on the front panel
c) Power supply , fixed voltage and variable voltage, single output as well as dual output.

7.2 Identification , familiarization and uses of commonly used tools; active and passive components; colour code and types of resistor and potentiometers

7.3 Cut, strip, join and insulate two lengths of wires/cables (repeat with different types of cables/ wires)

7.4 Demonstrate and practice the skill to remove components/wiresby unsoldering

7.5 Cut, bend, tin component, leads, inserts. Solder components e.g. resistor, capacitor, diodes, transistors on a PCB

7.6 Wiring of a small circuit on a PCB/tag strip involving laying, sleeving and use of identifier tags

7.7 Demonstrate the joining (or connecting) methods/mounting and dismantling method, as well as uses of the items mentioned below:

a) Various types of plugs, sockets, connectors suitable for general- purpose audio video use. Some of such connectors e.g. 2 and 3 pin mains plug and sockets, Banana plugs, sockets and

similar male and female connectors and terminal strips.

b) Various types of switches such as: normal/miniature toggle, slide, push button piano key, rotary, SPST, SPDT, DPST, DPDT, band selector, multi-way Master Mains Switch.

7.8 Exposure to modern soldering and de-soldering processes (Field visits)

7.9 De-solder pump, remove and clean all the components and wires from a given equipment, a PCB or a tag strip.