2.5 BASICS OF INFORMATION TECHNOLOGY

L	T	P
-	-	4

RATIONALE

Information technology has great influence on all aspects of life. Primary purpose of using computer is to make the life easier. Almost all work places and living environment are being computerized. The subject introduces the fundamentals of computer system for using various hardware and software components. In order to prepare diploma holders to work in these 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; use of various tools of MS office; using internet etc. form the broad competency profile of diploma holders. This exposure will enable the students to enter their professions with confidence, live in a harmonious way and contribute to the productivity.

Note:

Explanation of Introductory part should be dovetailed with practical work. Following topics may be explained in the laboratory along with the practical exercises. There will not be any theory examination.

TOPICS TO BE EXPLAINED THROUGH DEMONSTRATION

1. Information Technology – its concept and scope, applications of IT, impact of computer and IT in society.
2. Computers for information storage, information seeking, information processing and information transmission
3. Computer Application in office, book publishing, data analysis, accounting, investment, inventory control, graphics, Air and Railway Ticket reservation, robotics, Military, banks, Insurance financial transactions and many more
4. Elements of computer system, computer hardware and software; data types – numeric data, alpha numeric data; contents of a program, processing
5. Computer organization, block diagram of a computer, CPU, memory
6. Input devices; keyboard, Scanner, mouse etc; output devices; VDU and Printer, Plotter
7. Electrical requirements, inter-connections between units, connectors and cables
8. Secondary storage; magnetic disks – tracks and sectors, optical disk (CD, CD-RW and DVD), primary and secondary memory: RAM, ROM, PROM etc., Capacity; device controllers, serial port, parallel port, system bus
9. Installation concept and precautions to be observed while installing the system and software
10. Introduction about Operating Systems such as MS DOS, Windows, Windows NT etc. as an interface to Computer System
11. Special features, various commands of MS word and MS-Excel, MS PowerPoint
12. About the internet – server types, connectivity (TCP/IP, shell); applications of internet like: e-mail and browsing
13. Various Browsers like Internet explorer, Mozilla Fire fox, WWW (World wide web); hyperlinks; HTTP (Hyper Text Transfer Protocol); FTP (File Transfer Protocol)

14. Basics of Networking – LAN, WAN, Topologies
15. Ethics and information Technology
16. Future with information Technology

LIST OF PRACTICALS

1. Given a PC, name its various components and peripherals. List their functions
2. Practice in installing a computer system by giving connection and loading the system software and application software
3. Exercises on entering text and data (Typing Practice)
4. Installation of operating System viz. Windows XP, Windows 2007 etc..

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, colour (back ground and fore ground)
- Using short cuts
- Using on line help

5. 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, line spacing
   - 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 envelops and lables
- 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

6. MS-Excel

- Starting excel, open worksheet, enter, edit, data, formulae to calculate values, format data, create chart, printing chart, save worksheet, switching between different spread sheets
- 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 query: Create a pivot table, customising a pivot table. Statistical analysis of data
- Exchange data with other application: embedding objects, linking to other applications, import, export document.

7. MS PowerPoint

a) Introduction to 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.

8. Working with MS Access
   a) Understanding different data types
   b) Creation of table
   c) Entering data in a table and modify it.
   d) Creating simple Queries
9. 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

INSTRUCTIONAL STRATEGY

Since this subject is practice oriented, the teacher should demonstrate the capabilities of computers to students while doing practical exercises. The students should be made familiar with computer parts, peripherals, connections and proficient in making use of MS office, MS Excel, MS Power Point and MS Access in addition to working on internet. The student should be made capable of working on computers independently

RECOMMENDED BOOKS

1. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Information Technology for Management by Henery Lucas, 7th edition, Tata Mc Graw Hills, New Delhi
3. Computers Fundamentals Architecture and Organisation by B Ram, revised Edition, New Age International Publishers, New Delhi
4. Computers Today by SK Basandara, Galgotia publication Pvt ltd. Daryaganj, New Delhi.
5. MS-Office 2000 for Everyone by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., New Delhi
6. Internet for Every One by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
7. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
8. Mastering Windows 95, BPB Publication, New Delhi
9. Computer Fundamentals by PK Sinha; BPB Publication, New Delhi
10. Fundamentals of Information Technology by Leon and Leon;Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
11. On Your Marks - Net…Set…Go… Surviving in an e-world by Anushka Wirasinha, Prentice Hall of India Pvt. Ltd., New Delhi
12. Learning MS Office XP by Ramesh Bangia, Khanna Book Publishing Co. (P) Ltd., New Delhi.
13. Fundamentals of Information Technology by Vipin Arora, Eagle Parkashan, Jalandhar

2.6 ENGINEERING DRAWING - II

L	T	P
-	-	5

RATIONALE

Drawing is the language of engineers and technicians. Reading and interpreting engineering drawing is their day-to-day responsibility. The subject is aimed at developing basic graphic skills in the students so as to enable them to use these skills in preparation of engineering drawings, their reading and interpretation. The emphasis, while imparting instructions, should be to develop conceptual skills in the students following BIS SP 46 – 1988.

Note:

1) First angle projection is to be followed
2) Minimum 15 sheets to be prepared
3) BIS Code SP 46 -1988 should be followed
4) Instructions relevant to various drawings may be given along with appropriate demonstration, before assigning drawing practice to the students
5) 20 percent of drawing sheets to be prepared on the third angle projection
6) Punjab State Board of Technical Education, may recommend any of the CAD software viz. Solid Works, Pro Engineer, CATIA, NX, Inventor-AutoCAD etc.
7) The State Directorate of Technical Education may allocate funds for the purchase of computer systems and CAD software for drawing classes.
8) Continuous evaluation be done by the teachers for exercises/work done on CAD software. For this proper record may be maintained for its inclusion in the internal assessment**.**

DETAILED CONTENTS

1. Detail and Assembly Drawing (01 sheets)

   1.1. Principle and utility of detail and assembly drawings
   1.2. Introduction to CAD Software
   1.3. Practical exercise on drawing from detail to assembly or vice versa using wooden joints as example with CAD Software

2. Threads (Min.02 sheets)

   2.1 Nomenclature of threads, types of threads (metric). Single and multiple start threads
   2.2 Forms of various external thread sections such as V, Square, Acme, Knuckle, Metric, Seller and Buttress thread
   2.3 Simplified conventions of left hand and right hand threads, both external and internal threads
   2.4 Draw at least one sheet using CAD Software

3. Nuts and Bolts (Min.02 sheets)

   3.1 Different views of hexagonal and square headed bolts and nuts
   3.2 Assembly of nuts and bolts with washers
   3.3 Draw at least one sheet using CAD Software

4. Locking Devices (01 sheet)

4.1 Lock nuts, Castle nuts, Sawn nuts, Split pin lock nut
4.2 Spring washers, Locking plates.
4.3 Draw different locking devices using CAD Software

5. Screws, Studs and Washers (01 sheet)

5.1 Drawing various types of machine screws
5.2 Drawing various types of studs
5.3 Drawing various types of washers
5.4 Redraw the above sheet using CAD Software

6. Keys and Cotters (Min.03 sheets)

6.1 Various types of keys and their application. Preparation of drawings of various keys and cotters
6.2 Various types of joints (a) Sleeve and Cotter joint (b) Kunckle joint (c) Spigot and Socket joint
6.3 Draw any one joint using CAD Software

7. Rivets and Rivetted Joints (02 sheets)

7.1 Types of general purpose rivet heads
7.2 Types of rivetted joints - lap, butt (single cover plate and double cover plate), chain and zig-zag riveting.
7.3 Caulking and fullering of rivetted joints.
7.4 Draw any one type of rivetted joint using CAD Software

Instructional Strategy

The teachers teaching Engineering Drawing should first demonstrate then assist the students to prepare drawing sheets. The student should also be encouraged and motivated to learn CAD software at the earliest and do the given exercises.

RECOMMENDED BOOKS

1. A Text Book of Engineering Drawing by Surjit Singh, Dhanpat Rai & Co., New Delhi
2. Engineering Drawing by PS Gill, SK Kataria & Sons, New Delhi
3. Elementary Engineering Drawing in First Angle Projection by ND Bhatt, Charotar Publishing House
4. Engineering Drawing I & II by JS Layall, Eagle Parkashan, Jalandhar
5. AutoCAD 2010: For Engineers & Designers by Prof. Sham Tickoo & D. Sarvanan, Wiley India Pvt. Ltd., Delhi
6. CATIA for Beginners by Prof. Sham Tickoo, Wiley India Pvt. Ltd., Delhi
7. CATIA for Engineers and Designers by Prof. Sham Tickoo, Wiley India Pvt. Ltd., Delhi
8. Pro/Engineer Wildfire 5.0 for Engineers and Designers by Prof. Sham Tickoo, Wiley India Pvt. Ltd.,Delhi.

9. NX 6: For Engineers and Designers by Prof. Sham Tickoo, Wiley India Pvt. Ltd., Delhi.
10. Solidworks 2009: The Basics by David C. Planchard, Schroof Development Corporation, Post Box 1334, Mission KS 66222, USA.
11. Solidworks 2010 for Engineers and Designers, Prof. Sham Tickoo, Wiley India Pvt. Ltd, Delhi

2.7 GENERAL WORKSHOP PRACTICE - II

L	T	P
-	-	6

RATIONALE

As we know that, the psychomotor skills are mastered through practice, an opportunity therefore, has been extended to students through this course to refine their skills in different trades. The basic skills developed during first semester will be refined during this course by doing higher order skills jobs. In addition to developing general manual and machining skills in the students, the objective of development of sense of dignity of labour, precision, safety at work places, team working and right attitude among the students will also be met.

DETAILED CONTENTS (PRACTICALS)

The following shops are included in the syllabus. Student can opt relevant shops depending upon the need of his/her branch of diploma programme :

1. Carpentry and painting shop-II
2. Fitting shop -II
3. Welding shop -II
4. Electric shop -II
5. Smithy shop –II or Electronic shop-II
6. Sheet Metal Shop –II

Note:

1. The branches e.g. Civil Engineering, Electrical Engineering, Mechanical Engineering, Mechanical (RAC), Production and Industrial Engineering will do **Smithy Shop -II** instead of Electronic shop- II

and

2. The branches e.g. Electronics and Communication Engineering, Electronics (with Specialization in Microprocessor), will do **Electronic shop- II** instead of Smithy Shop-II

3 The instructor is to first explain the introductory part given at the beginning under each shop followed by demonstration and practice by students.

1. Carpentry and Painting Shop - II

1.1 Introduction to joints, their relative advantages and uses.
Job I Preparation of Dovetail joint and glued joint.
Job II Preparation of Mitre Joint
Job III Preparation of a lengthening Joint
Job IV Preparation of atleast one utility job with and without lamination.

1.2 Demonstration of job showing use of Rip Saw, Bow saw and Tenon saw, method of sharpening various saws.

1.3 Demonstration of job on Band Saw and Circular Saw, Chain and Chisel, Universal wood working machine, Saw re-sharpening machine, Saw Brazing unit.

1.4 Importance and need of polishing wooden items, Introduction to polishing materials.
Job V Preparation of surface before polishing including prime coat.
Job VI Polishing on wooden items.

2 Fitting Shop – II

2.1 Introduction to various types of threads (internal, external)-single start, multi-start, left hand and right hand threads.

2.2 Description and demonstration of various types of drills, taps and dies Selection of dyes for threading, selection of drills and taps for tapping operations.

Job I Making internal and external threads on a job by tapping and dieing operations (manually)

2.3 Precautions while drilling soft metals, e.g. Copper, Brass, Aluminium etc.

Job II Drilling practice on soft metals (Aluminum, Brass and Copper)

2.4 Care and maintenance of measuring tools like calipers, steel rule, try square, vernier calipers, micrometer, height gauge, combination set. Handling of measuring instruments, checking of zero error, finding of least count.

Job III Peparation of a job by filing on non- ferrous metal up to an accuracy of $\pm$ 0.1mm

Job IV Preparation of job involving thread on GI pipe/ PVC pipe and fixing of different types of elbow, tee, union, socket, stopcock, taps, etc

3. Welding Shop – II

3.1 Introduction to gas welding, spot welding and seam welding and machinery and equipment used. Adjustments of different types of flames in gas welding, demonstration and precautions about handling welding equipment.

Job I Practice in handling gas welding equipment (Low pressure and High pressure) and welding practice on simple jobs.

3.2 Common welding joints generally made by gas welding.

Job II Preparation Butt joint by gas welding.

Job III Preparation of small cot frame from conduit pipe by electric arc welding/gas welding.

Job IV Preparation of square pyramid from MS rods by welding (type of welding to be decided by students themselves).

Job V Exercise of preparing a job on spot/seam welding machine.

4 Electric Shop – II

4.1 Importance of three-phase wiring and its effectiveness.

Job I Laying out 3 phase wiring for an electric motor or any other 3 phase machine.

Estimating and costing of power connection.

Job II Connecting single-phase energy meter and testing it. Reading and working out the power consumption and the cost of energy.

Job III Checking continuity of connection (with tester and series lamp) location of faults with a multimeter) and their rectification in simple machines and/or other electric circuits fitted with earthing.

Demonstration of dismantling, servicing and reassembling a table fan/ceiling fan/air cooler/mixer/electric iron, Electric heater, geyser, electric oven, air conditioner etc.

Job IV Dismantling, servicing and reassembling of any of the above electrical appliances.

Job V Testing Single phase/three phase electrical motor by using voltmeters, ammeter, clip on meter, tachometer etc.

Job VI Reversing the rotation of a motor.

5. Smithy Shop – II

5.1 Introduction to various heat treatment processes e.g annealing, hardening, tempering, normalizing etc.

5.2 Description of various types of power hammers and their usage (Demonstration only).

Job I To forge a ring to acquaint the students with forge welding

Job II To forge a chisel and acquaint the students with simple idea of hardening and tempering .

Job III To forge squares on both ends of a circular rod

Job IV To forge a single/double ended spanner.

Job V To prepare a job involving drawing down process

OR

6. Electronic Shop- II

6.1 Demonstrate the jointing methods. mounting and dismantling as well as uses of the items mentioned below:

a) Various types of single, multi-cored insulated screened power, audio video, co-axial, general purpose wires/cables

b) Various types of plugs, sockets connectors suitable for general purpose audio and video use, 2 and 3 pin mains plug and sockets.

Banana-plugs, and sockets, BNG, RCA, DIN, UHF, Ear phone speaker connector, telephone jacks and similar male and female connectors and terminal strips.

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

d) Various types of protective devices such as : Wire fuse, cartridge fuse, slow acting/fast acting fuse, HRC fuse, thermal fuse, single/multiple circuit breakers, over and under current relays.

6.2 Identification and familiarisation with active and passive components; colour code and types of resistor, capacitors and potentiometers (including VDR, LDR, and thermistor). Identification of components including LED, LCD, UJT, FET, Coils, relays, switches (SPDT, DPDT, etc.) connectors, micro switches, read relays, transformers (mains, audio and RF, etc) Linear and Digital ICs, Thyristors, etc.

6.3 Demonstrate the following:

1) To make perfect solder joints and soldering on PCBs
2) To remove components/wires by unsoldering.
3) To assemble components on boards, chassis, tape strips.
4) Various laying methods of cables
5) Exposure to modern soldering and de-soldering processes
6) Field visits to relevant work-places

Job I De-solder, remove and clean all the components, wires from a given equipment, a PCB or a tap strip using the following:

Job II Soldering Iron

Job III Temperature Control Soldering Iron

Job IV De-soldering Pump

Job V De-soldering Strip

Job VI Wiring of a small circuit on a PCB/tag strip involving lacking, sleeving and use of identifier tags

6. Sheet Metal Shop-II

6.1 Introduction to various metal forming processes e.g. Spinning, Punching, Blanking, cup drawing

6.2 Introduction to soldering and brazing.

6.3 Introduction to metal spinning process.

Job I Preparation of job involving shearing, circular shearing, rolling, folding, beading and soldering process e.g. Funnel or any other job involving above operations.

Job II Exercise on job involving brazing process

Job III Spinning a bowl/cup/saucer

Job IV Visit to a sheet metal industry e.g. coach builders etc.

RECOMMENDED BOOKS

1. Workshop Technology I,II,III, by S K Hajra, Choudhary and A K Choudhary. Media Promoters and Publishers Pvt. Ltd., Bombay
2. Workshop Technology by Manchanda Vol. I,II,III India Publishing House, Jalandhar.
3. Manual on Workshop Practice by K Venkata Reddy; MacMillan India Ltd. New Delhi
4. Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd., New Delhi
5. Workshop Technoogy by B.S. Raghuwanshi, Dhanpat Rai and Co., New Delhi
6. Workshop Technology by HS Bawa, Tata McGraw Hill Publishers, New Delhi

ECOLOGY AND ENVIRONMENTAL AWARENESS CAMP

A diploma holder must have knowledge of different types of pollution caused due to industries and constructional activities so that he may help in balancing the eco system and controlling pollution by pollution control measures. He should also be aware of environmental laws related to the control of pollution.

This is to be organized at a stretch for 3 to 4 days. Lectures will be delivered on following broad topics. There will be no examination for this subject.

1. Basics of ecology, eco system and sustainable development
2. Conservation of land reforms, preservation of species, prevention of advancement of deserts and lowering of water table
3. Sources of pollution - natural and man made, their effects on living and non-living organisms
4. Pollution of water - causes, effects of domestic wastes and industrial effluent on living and non-living organisms
5. Pollution of air-causes and effects of man, animal, vegetation and non-living organisms
6. Sources of noise pollution and its effects
7. Solid waste management; classification of refuse material, types, sources and properties of solid wastes, abatement methods
8. Mining, blasting, deforestation and their effects
9. Legislation to control environment
10. Environmental Impact Assessment (EIA), Elements for preparing EIA statements
11. Current issues in environmental pollution and its control
12. Role of non-conventional sources of energy in environmental protection