Marwadi University
Faculty of Diploma studies
Information and Communication Technology

Semester – II
Subject Name: ICT Workshop

Subject Code: 09CT0105

Diploma Branches in which this subject is offered: Information & Communication Technology

Objective:

This course deals with basic introduction of system components of electronic systems, and provides hands on practice in assembling, interconnecting, testing, and repairing such system by making use of various tools. Also, this course will provide a much needed knowledge of computer hardware and networking, enabling them to identify and rectify the onboard computer hardware, software and network related problems. With the help of this course the student will be able to understand the hardware specifications that are required to run operating system and various application programs.

Credits Earned: 3 Credits

Course Outcomes: After completion of this course, student will be able to

1. Understand Basic Computer components and tools.
2. The students will apply knowledge of engineering to design and conduct experiments using PCB design software.
3. Identify the existing configuration of the computers and peripherals.
4. Apply their knowledge about computer peripherals to identify / rectify problems onboard.
5. Integrate the PCs into local area network and re-install operating system and various application programs.

Pre-requisite of course: Electronics Practice

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term work	
0	0	6	3	00	30	20	25	25	100

Contents:

Unit	Topics	Contact hours	Weightage (%)
1	**Introduction and Assembling of computer** Basics of computer modules, Assembling various computer parts like Processor (CPU), Computer Case, Optical Drives, Memory, Power Supply, Motherboard, Processor Fan, Case Fan	8	12
2	**Introduction to various network components** Understanding Network Components like Routers, Hubs, Switch, Bridge, Gateways, NICs, Wireless Access Points, Modems	10	14
3	**PCB Design Process** Conception Level Introduction: Specifying Parts, Packages and Pin Names, Libraries and Checking foot prints of the components, Partlist, Placing Parts, Routing Traces, Modifying Traces, Mounting Holes, Adding Text, PCB Layout, Pattern Transfer.	13	18
4	**Installation of operating system** Introduction to Operating systems, Step wise process to install Operating Systems	10	14
5	**Establishment of local area network and implementation of file sharing on network** Understanding basic Network Topologies, Cramping of LAN, Setting up connections between PCs, File Transferring and Sharing	12	18
6	**User Centric Applications using open source boards and IDE** Various boards, hardware specifications, components and various pins, connection with hardware and libraries, Program structure, use of built in functions and use define functions, implementation of project	17	24
TOTAL HOURS		**70**	**100**

Suggested List of Experiments:

Sr. No.	Unit No.	Name of Topics
1	1	Measure amplitude & frequencies of different type of waveforms using CRO & Function Generator.
2	1	Identify, find value and test different types of resistors, capacitors. (also include transistor, diode, relay)
3	7	Prepare LAN Cable using cramping tools.
4	7	Setting up connection LAN connection using switch between more than 2 computers.
5	4	Understand setup and configure simple home wifi-router.
6	5	Create schematic and layout of given electronic circuit using any PCB design software.
7	5	Understand and perform PCB etching and drilling process on single layer pcb.
8	6	Install single bootable operating system step by step on computer.
9	ALL	Understand and perform voltage regulation using 78XX and 79XX ICs.
10	7	Interfacing of Temperature and Humidity sensors
11	7	Speed and intensity control using PWM.
12	7	Integration of bluetooth module with mobile phone.
13	ALL	Prepare one project on general single layer pcb. (Project will be suggested by faculty)
14	7	Prepare one project on social/community needs (Project will be suggested by faculty)

Student Activity:

Complete online course and get certificate for any one topic suggested by faculty member.
Prepare one project using single layer PCB designing. (project will be suggested by faculty member)

Instructional Method:

a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

c. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

d. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

Reference Books:

1. Al Williams, "Build Your Own Printed Circuit Board", Mc GrawHill, 2003 or latest edition
2. BPB, "Hobby Electronics Project Special", B P B, 2011

Suggested Resources

1. www.freepcb.com/
2. https://en.wikipedia.org/wiki/Networking_cables
3. http://www.groundcontrol.com/galileo/ch5-ethernet.htm