

Devi Ahilya University, Indore, India Institute of Engineering & Technology				II Year B.E.(Information Technology) (Full Time)			
Subject Code & Name	Instructions Hours per Week			Credits			
3ITRL1 Computer Hardware & IOT Lab	L	T	P	L	T	P	Total
	0	0	2	0	0	1	1

Learning Objectives:

- To provide the knowledge of computer hardware and the latest technology.
- To provide the basic knowledge of the working of the internal parts of the computer system.
- To develop skills to analyze and find the fault in the computer system.
- To provide knowledge of different smart system applications.
- To familiarize students with Arduino as IDE, programming language & platform.
- To provide knowledge of Arduino boards and basic components.
- Develop skills to design and implement various smart system applications.

Pre requisites: Basic knowledge of C++ Programming.

COURSE CONTENTS

UNIT-I

Processor: Basics of Processor and Computer Generation, Study of Different Processor, Pentium, Dual Core, Quad Core, I3, I5, I7, I9 Processor, Motherboards, Chipset and Controllers, BIOS and the Boot Process.

UNIT-II

Internal Components: IDE and SATA Devices: Hard Disk Drive and CD/DVDs Drives, SCSI Devices, Floppy Disk, Zip Drive, Backup Drive, Expansion Cards- LAN Card, IDE Card, VGA and SVGA Cards, Sound Card, Interface Cards, I/O cards, Video Cards, USB Card, Internal Ports, Cables and Connector Types, SMPS.

UNIT-III

Computer Peripherals: Monitors:- CRT, LCD and LED Displays, Printers:- Dot-Matrix Printer, Inkjet Printer, Laser Printer Scanner:- Photo Scanner, Documents Scanner, Bar Code Scanner, Keyboards, Mouse, External Modem, Ports and Connectors, Batteries, Pen Drives, SCSI interface devices, Laptop Computers, Digital Advance Storage Technology.

UNIT-IV

Introduction to Arduino & IOT: Introduction to Arduino board & Arduino IDE
Understanding IoT fundamentals, Analog input and analog output on Arduino Mega board using PWM, LCD Display, Serial Communication between Arduino board and PC.

UNIT-V

Sensor & Actuators with Arduino:

Overview of Sensors working, Interfacing of actuators with Arduino, Motor Control, Servo Motor Control, Stepper Motor Control, TV Remote, TV Remote with LCD, Timer Control, Ethernet, Bluetooth & Wi-Fi.

Learning Outcomes

Upon completing the course, the student will

- Gain the knowledge of hardware parts of a computer and the assembling the computer system.
- Gain knowledge of different smart system applications.
- Acquaint with Arduino as IDE, programming language & platform.
- Know about Arduino boards and basic components.
- Develop skills to design and implement various smart system applications.

List of Practical Assignment.

- 1) Study of the motherboard.
- 2) Study of the processor.
- 3) Study of SMPS and UPS.
- 4) Study of CD-ROM and DVD-ROM.
- 5) Study the working of the keyboard and mouse.
- 6) Study of different ports and slots.
- 7) Study of various types of cables & connectors.
- 8) Study of monitor.
- 9) Study of different types of printers.
- 10) Study of assembling and disassembling of a computer system.
- 11) Experiments on analog input and analog output on Arduino Mega board using PWM.
- 12) Experiment on LCD display:-Print numbers, Name, Time etc.
- 13) Characters send and received, Read and display voltage using arduino.
- 14) Experiments on DC motors to control motor speed and direction of rotation.
- 15) Experiments on servo Motor to rotate servo motor.
- 16) Experiments on Stepper Motor to rotate bidirectional.
- 17) Experiments on TV Remote with LCD.

BOOKS RECOMMENDED:

- [1] B. Govinda Rajalu, PC AND CLONES Hardware, Troubleshooting and Maintenance, Tata Mc Graw-Hill Publications, 2002.
- [2] Stephen J. Bigelow, PC Troubleshooting and Repair, Dream Tech Press, New Delhi.
- [3] Red Hat Linux by BPB & SYBEX Publication, 1995.
- [4] Rajkamal, Internet of Things, Architecture and design Principles, Mc Graw Hills, 2017
- [5] Hakima Chaouchi, The Internet of Things Connecting Objects to the Web, Wiley Publications, 2010