CBCS -Syllabus

Computer Hardware

B.Sc. (M.Ch.Cs.)

(For the Students admitted in 2019-20&onwards)

Department of Physics
Nizam College (Autonomous)
Osmania University
Hyderabad – 500 001

Semester	Courses	Hours per week	Duration of Exam Hrs	Marks			No. of Credits
				Internal	External	Total	
SEM-I	**Theory**						
	DSC-103: Digital Circuits and Combinational Logic**(**Paper-I)	4	3	20(15+5)	80	100	4
	Practicals						
	DSC-103P: Digital electronics Lab-(Paper-I)	3	3		50	50	1
SEM-II	**Theory**						
	DSC-203: Digital design(Paper-II)	4	3	20(15+5)	80	100	4
	Practical						
	DSC-203P: Digital Design Lab(paper II)	3	3		50	50	1

SEM III	Theory	Hrs/ week	Duration of exam hrs	Int. Marks	Ext. Marks	Total marks	No. of credits
	DSC-303: Microprocessor Architecture, Programming and Applications with the 8085(Paper-III)	4	3	20(15+5)	80	100	4
	Practicals						
	DSC-303P: Microprocessor-8085 Lab (Paper-III)	3	3		50	50	1
	SEC-I:Introduction to Internet of things(IOT)	2	$1^{1/2}$	10	40	50	2

SEM IV	Theory	Hrs/ week	Duration of exam hrs	Int. Marks	Ext. Marks	Total marks	No. of credits
	DSC-403:The 8051- Microcontroller and Embedded Systems.	4	3	20(15+5)	80	100	4
	Practicals						
	DSC-403P: Microcontroller-8051Lab	3	3		50	50	1
	SEC-II: Programming Internet of Things	2	$1^{1/2}$	10	40	50	2

SEM V	Theory	Hrs/ week	Duration of exam hrs	Int. Marks	Ext. Marks	Total marks	No. of credits
	GE-CHE Digital system and computer hardware	4	3	20(15+5)	80	100	4
	DSE-503A:: computer hardware-I DSE-503B:: VHDL	4	3	20(15+5)	80	100	4
	Practicals						
	DSE-503AP: Computer hardware-I Lab	3	3		50	50	1
	DSE-503BP:: VHDL-LAB	3	3		50	50	1

Sem.	Courses	Hours per week	Duration of Exam Hrs	Marks			No. of Credits
				Internal	External	Total	
SEM VI	**Theory**						
	DSE-603A: Computer hardwareII	4	3	20(15+5)	80	100	4
	DSE-603B:Computer networks	4	3	20(15+5)	80	100	4
	Practicals						
	DSE-603AP: Computer hardware-IILab	3	2		50	50	2
	DSE-603BP : Computer networks Lab	3	2		50	50	2
	PROJECT	4	1 1/2	25Viva& Presentation	75-PR	100	4
	Total						

SNO	COURSE CATEGORY	NO OF COURSES	CREDITS PER COURSE	TOTAL CREDITS
1	SEC	2	2	4
2	GE	1	4	4
3	PROJECT	1	4	4
4	DSC	4	4+1	20
5	DSE	4	4+1	20
		TOTAL CREDITS		52

DSC: Discipline Specific Course, DSE: Discipline Specific Elective, GE (General Elective)

Nizam College (Autonomous)
Department of Physics
COMPUTER HARDWARE
Semester: I
DSC-103
Digital circuits and combination logic

I Year B.Sc **60 hours (4 hrs/week)**

Unit I: Basic Electronic Devices and Logic Gates **15 hours**

Binary Number Systems, Binary to Decimal, Decimal to Binary conversion, Hexadecimal system. Introduction to ASCII and Gray codes; Resistors and colour coding, capacitors and Inductors

Kirchoff's Laws, Network theorems: Thevenin's, Norton's, Maximum Power transfer, Superposition theorems

Unit II: Circuit Analysis and Design **15 hours**

Gates: Inverter/Not, OR, AND Gates: truth tables, NOR,NAND gates, Demorgan's theorems, Boolean algebra, Equations of logic gates, sum of the products method, truth table to karnaugh map, pairs, quads and octets etc. Karnaugh simplification, product of sums method. Data processing Circuits: Multiplexers, Encoders and Decoders, Exclusive or gate, Parity generators and checkers.

Unit III: Arithmetic Circuits **15 hours**

Binary Addition, subtraction, 2's complement, 2's complement Arithmetic, Arithmetic Building Blocks: Half adder, full adder, the Adder Subtractor, Binary Multiplication and Division, Read Only Memory(ROM), Programming the ROM, Application, Random Access Memory(RAM).

Unit IV: Sequential Digital Systems **15 hours**

A 1-bit storage cell (Flip-Flop). The clocked R-S Flip Flop, the J-K Flip Flop, the T-Flip Flop, Shift Registers, Ripple (Asynchronous) counter, Divided-by-N Computer, Synchronous counters, Applications of Counters, the J-k Flip Flop, present and Clear, race around condition, Master slave J-K Flip-Flop, The D- type Flip Flop, Random-Access Memory (RAM), Memory Decoding, Error-Correcting Codes.

Recommended Books:

1. Digital Principles and Application: Albert Paul Malvino, Donald P.Leach.
2. Digital Design: Morris Mano.

Digital Electronics Lab

Semester-I- DSC-103P

45 hours (3 hrs/week)

Experiments List:

1). Logic Gates verification of Truth Tables

2). Verification of Demorgan's Laws.

3). Half Adder using Gates.

4). Full Adder using Gates.

5). Multiplexer.

6). De Multiplexer.

7). SOP,POS.

8).Gray to Binary,Binary to Gray Conversion.

Other Experiments as suggested by the teacher.

Nizam College (Autonomous)
Department of Physics
COMPUTER HARDWARE
Semester-II
DSC-203
Digital Design

I Year B.Sc **60 hours (4 hrs/week)**

UnitI: Digital Integrated Circuits **15 hours**

Introduction, Special Characteristics, Bipolar –Transistor Characteristics, RTL and DTL Circuits, Transistor-Transistor Logic Circuits (TTL),Emitter-Coupled Logic Circuits(ECL), Metal-Oxide Semiconductor(MOS), Complementary MOS(CMOS), CMOS Transmission Gate Circuits.

UnitII: Synchronous Sequential Logic **15 hours**

Introduction, Flip-Flop Excitation Tables, Characteristic Equations for Flip Flops, Sequential Circuits or State Machines, Mealy and More Models (Block Diagrams only), Analysis of Clocked Sequential Circuits, State Tables and State Diagrams. Design Procedure, Designing SM with Edge Triggered Flip Flops (D,J-K Type), State Reduction and Assignment, Design of Counters, Binary Sequence and Non-binary Sequence.

UnitIII: MIS and PLD Components, Algorithm State Machines (ASM) **15 hours**

Introduction, Binary Adder and Subtractor, Decimal Adder, Magnitude Comparator, Decoders and Encoders, Multiplexers, Read Only Memory(ROM), Programmable Logic Array(PLA) Programmable Array Logic(PAL). Introductionto ASM Chart, Timing Considerations, Control implementations, Design with Multiplexers, PLA control.

UnitIV: Operational Amplifiers and Data Convertors. **15 hours**

Introduction to Operational amplifiers,Inverting,Non-Inverting amplifiers, R-2RLadder,Integrated Analog to digital, Digital to analog converters.

Recommended Books:

1. Digital Design: Morris Mano, PHI
2. Digital Principles and Applications: Malvino& Leach, TMH

Digital design Lab –II

Semester-II- DSC-203P

Experiments List: **45 hours (3 hrs/week)**

1). R-S, Clocked R-S Flip Flops.

2). Type-D, Type-T Flip Flops.

3). J-K, Master-Slave J-K Flip Flops.

4). BCD-Seven Segment Driver.

5). Binary Counter.

6). Decade Counter

7). Shift Register.

8). Diode, Transistor, MOSFET Characteristics, Operation as a switch,

9). RTL,TTL, CMOS gates using Discrete components.

**Encouraged to do small applications using Digital logic as suggested by the teacher.*

Nizam College (Autonomous)
Department of Physics
COMPUTER HARDWARE
Semester: III
DSC-303
Microprocessor Architecture, Programming and Applications with the 8085

II Year B.Sc **60 hours (4 hr/week)**

Unit I:8085 Microprocessor Architecture and Memory, I/O Interfacing 15 hours

The 8085 MPU, Architecture, Pin details, General purpose registers, ALU, Status and control signals, Interrupts. Example of an 8085-Based Microcomputer, Generation of control signals, Memory Interfacing, 8155- Memory Section, Basic Interfacing Concepts, Interfacing Output Displays, Interfacing Input Devices, Memory-Mapped I/O.

Unit II: Instruction Set of the 8085 15 hours

The 8085 Instruction set, Classification, InstructionsFormat, Data Transfer Operations, Arithmetic,Logical, Branching Operations, Programming Techniques with Looping, Counting and Indexing, 16-Bit Data Transfer and Arithmetic Instructions, Arithmetic Operations Related to Memory. Conditional Call and Return Instructions, Subroutine Concepts, Stack, Time delay, BCD-to-Seven Segment-Led, BCD Arithmetic, Code conversions, Examples.

Unit III: Interrupts 15 hours

The 8085 Interrupts, Additional 8085 Interrupts, Restart as Software Instructions, Additional Concepts and Processes, The 8259 Programmable Interrupt Controller. Software Development System and Assemblers.Introduction to Intel 8086 microprocessor, comparing architecture and registers of 8085 with8086. Writing Simple Programs using assembler.

Unit IV: Interfacing peripherals to 8085 15 hours

General-Purpose Programmable Peripherals, The 8255 A Programmable Peripheral Interface,Interfacing Keyboard and seven-Segment, Display, Bi-directional Data Transfer between Two Micro Computers. The 8254(8253) Programmable Interval Timer, programming the 8253 as a Counter. The 8257 DMA Controller DMA Interfacing, Initialization, DMA Execution. Digital-to-Analog(D/A) Converters, Analog-to-Digital(A/D) Converters and interfacing.

Recommended Books:

1). Microprocessor Architecture, Programming Applications with the 8085/8080A: Gaonkar (Wiley Eastern Ltd.)
2).Introduction to Micro Processors:-AdityP.Mathur (Tata McGraw Hills)
3). 8080/8085 Assembly Language Programming: -Lance (Lavental) (Tata McGraw Hill)
4). Microprocessor and Microcontrollers: - Prof.C.R.Sarma (Premier Publishing House)

Microprocessr-8085 Lab
Semester-III-DSC-303P

Experiments List: **45 hours (3 hrs/week)**

1). Addition of 8bit,16bit numbers
2). Subtraction of numbers
3). Multiplication of 8bit numbers
4). Division of an 8bit number with another 8bit number
5). Finding the factorial of a given number.
6). Finding the sum of series of N numbers.
7). Finding the Largest number.
8). Hexadecimal to Decimal conversion.
9). Interfacing Stepper Motor.
Other Experiments as suggested by the teacher

Nizam College (Autonomous)
Department of Physics
COMPUTER HARDWARE
Semester: IV
DSC-403

Microcontroller and Embedded Systems

II YearB.Sc

60 hours (4 hrs/week)

Unit I: The 8051 Microcontrollers **15 hours**

Microcontrollers and Embedded Processors, Overview of the 8051 Family, Architecture and Pin description.Assembly Language Programming, Assembling and Running an 8051 Program. The Program Counter and ROM Space in the 8051, Data types and Directives, 8051 Flag Bits and the PSW Register, RAM, Register Banks, S.F.R, DPTR, I/O Ports and Stack Pointer.

Unit II: I/O Port Programming of 8051 **15 hours**

I/O Programming, Bit Manipulation. Addressing Modes: Immediate, register, Direct, Indirect.Accessing Memory Using Various Addressing Modes.Arithmetic Instructions and Programs, Logic Instructions, and Programs, Single-Bit Instructions, Branching Instructions, Call and Return and Programming.Generating SoftwareDelay,Calculating Delay.Interfacing LEDs to the Ports.Basics of KEIL Software and Programming.

Unit III: Timer/Counter, Simple Interfaces **15 hours**

Timers in 8051, TMOD, TCON registers, Using Timers in Poling. Generating Hardware Time Delays, Generation of Wave forms using D/A converters. Timer as a Counter, Interfacing LED, LED - Seven - Segment, LCD Display. Programmable Peripheral Interface 8255. Interfacing Stepper -Motor, Key- Pad and Sensors Interfacing

Unit IV: Interrupts and Serial Communication. **15 hours**

8051 Interrupts, Programming Timer Interrupts, External Hardware Interrupts, Serial Communication Interrupts, Interrupts- Priority in the 8051. Basics of Serial Communication: 8051 Connection to RS232, 8051 Serial Communication Programming. Introduction to Atmel ATMEGA Micro controllers.Arduino C++ Basics.

Recommended Books:

1. The 8051 Microcontroller: Architecture, Programming, and Applications. Author: Kenneth J. Ayala
2. 8051 and Embedded Systems. Author: Muhammad Ali Mazidi
3. Microprocessors and Microcontrollers. Author: Prof.C.R.Sarma (Premier House)

Microcontroller 8051 Lab
Semester-IV- DSC-403P

Experiments List: **45 hours (3hrs/week)**

Basic Experiments

1). Addition of 8bit,16bit numbers.
2). Subtraction of 8bit,16bit numbers.
3). Multiplication of 8bit numbers
4). Division of 8bit number with another 8bit number
5). Finding the factorial of a given number.
6). Finding the sum of series of N numbers.
7). Finding the Largest number.
8). Hexadecimal to Decimal conversion.
9). 2's compliment of 8bit,16bit numbers

Interfacing Experiments

10). Stepper Motor.
11).LED Seven Segment Display
12). LCD Interfacing and Text Scroll
13). Digital to Analog Conversion.

**Encouraged to do small applications using Microcontrollers as suggested by the teacher.*

Nizam College (Autonomous)
Department of Physics
Computer Hardware

SEM-III, 2020-2021

SEC-1: Introduction to Internet of Things (IoT)

30 hours (2hrs/week)

Unit-1 **15 hours**

Introduction,Definition & Characteristics of IoT,Physical Design of IoT, Logical Design of IoT,IoT Enabling Technologies,IoT Levels & Deployment Templates.Domain Specific IoTs,IoT and M2M.Software Defined Networking SDN, Network Function Virtualization NFV.

Unit-2 **15 hours**

Need for IoT Systems Management, Simple Network Management Protocol, SNMP Limitations, Network Operator Requirements,IoT Systems Management with NETCONF-YANG.IoT Platforms Design Methodology.Importance of Python and Motivation. Case study: Home Automation or Weather Monitoring

Reference Books:

*1).Internet of Things: A Hands-on Approach, ArshdeepBahga and Vijay Madisetti

Hands On Books Series

2).Designing the Internet of Things by Adrian McEwen and Hakim Cassimally

3). 1. "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", byPethuru Raj and Anupama C. Raman (CRC Press).

Nizam College (Autonomous)
Department of Physics
Computer Hardware
SEM-IV, 2020-2021
SEC-2: Programming Internet of Things (IoT)

30 hours (2hrs/week)

Unit-1 **15 hours**

IoT Systems - Logical Design using Python**:** Introduction, Installing Python, Python Data Types & Data Structures**:** Numbers, Strings, Lists, Tuples,Dictionaries, Type Conversions. Control Flow**:**if,for,while,range,break/continue,pass.

Unit-2 **15 hours**

Functions, Modules, Packages. File Handling, Date/Time Operations, Classes. Python Packages of IoT.IoT Devices, Pin outs of Raspberry Pi, Simple Programs on Raspberry Pi with Python.Features ofNODE MCU ESP32.

Reference Books:

*1).Internet of Things: A Hands-on Approach, ArshdeepBahga and Vijay Madisetti Hands On Books Series

2).Designing the Internet of Things by Adrian McEwen and Hakim Cassimally

3) The Internet of Things: Enabling Technologies, Platforms, and Use Cases byPethuru Rajand Anupama C. Raman (CRC Press).

4). ESP32 Programming for the Internet of Things - Second Edition.BySever Spanulescu

Official website. http://esp32.net/

Nizam College (Autonomous)
Department of Physics
COMPUTER HARDWARE
Semester - V
GE-CHW
Digital Systems and Computer Hardware

60 hours (4hrs/week)

Unit-I Number Systems and Digital Logic 15 hours

Number Systems: Binary Number Systems, Binary to Decimal, Decimal to Binary conversion, Hexadecimal system. Introduction to ASCII and Gray codes.Binary Addition, subtraction, 2's complement, 2's complement Arithmetic, **Digital Logic Gates:** Inverter/Not, OR, AND Gates: truth tables, NOR, NAND gates, Demorgan's theorems, Boolean algebra, Equations of logic gates, sum of the products method, truth table to karnaugh map, pairs, quads and octets etc. Karnaugh simplification, product of sums method. Data processing Circuits: Multiplexers, Encoders and Decoders, Exclusive or gate, Parity generators and checkers

Unit-II Combinational Circuits 15 hours

Arithmetic Building Blocks: Half adder, full adder, the Adder Subtractor, Binary Multiplication and Division, **Memory:** 1-bit storage cell (Flip-Flop). The clocked R-S Flip Flop, the J-K Flip Flop,D- type Flip Flop,Read Only Memory (ROM), Programming the ROM, Application, Random Access Memory (RAM).

Unit-III Computer Hardware
15 hours
Components of a computer: Motherboard components, RAM slots, Processor Sockets, SATA Connectors, Specification and internal parts of Hard disk. Internal parts of DVD R/W. Switch Mode Power Supply (SMPS). Voltages and current ratings, types of display (CRT, LCD, OLED) and specifications. VGA, DV, HDMI ports. **Assembly and Testing:** Front panel connections, Audio drivers and chipsets. Assembling a PC, Installing Operating system. Buzzer Sounds and Simple troubleshooting.

Unit-IV Micro Computers 15 hours

Architectures: Intel 8085/86 microprocessor Architecture. Intel 8051Microcontroller Architecture, comparison between microprocessors and Microcontrollers.
Intel 8051: 8051 Pinouts, PSW, registers, RAM, ROM and Timers. Special Function Registers (SFR's). instruction set: Arithmetic, Logical and Branching instructions, Interrupts, Call and RET. Bit Oriented Instructions simple programs and applications.

Recommended Books:

1. Digital Principles and Application: Albert Paul Malvino, Donald P.Leach.
2. The 8051 Microcontroller, Architecture, Programming, and Applications.byKenneth J. Ayala
3. 8051 and Embedded Systems. Author: Muhammad Ali Mazidi
4. Microprocessors and Microcontrollers. Author: Prof.C.R.Sarma (Premier House)
5. PC Hardware-A Beginners Guide – Ron Gilster, (McGraw-Hill)

Department of Physics

COMPUTER HARDWARE

Semester: V

DSE-503A

Computer Hardware-I

III YearB.Sc **60 hours (4hrs/week)**

Unit-I.Processors, Mother Boards and buses: 15 hours

Processors: Evolution, classification of computers, modern computers and history of PC, system types and system components. PC Processors and architecture Evolution, processor specifications, features, manufacturing, processor sockets and slot types. Code names, general features of 386, Intel Pentium 4 processor.Intel core processors.Processor cooling and Heat-sink rating calculations, Processor troubleshooting techniques.

Motherboards and Buses: Mother board form Factors, obsolete form factor, ATX and other modern form factors. Processor sockets/slots. Chipsets, evolution, Intel chipsets and models.Traditional north/south bridge architecture, hub architecture. Block diagram representation of 486,P5 chipsets, Intel Integrated Graphics. Motherboard Connectors and system Bus types; the Processor Bus, Memory bus, I/O Buses, System Resources, Motherboard selection criteria.

Unit II:BIOS, memory and ATA/IDE interfaces: 15 hours

BIOS: Basics, ROM BIOS, the BIOS upgrading, plug and play BIOS and BIOS Error Messages.**Memory:**ROM, DRAM, SRAM, types of RAM and upgrades, troubleshooting memory.

ATA/IDE interface: Overview of the IDE interface, ATA standards; parallel ATA and serial ATA, ATA features and ATA drive capacity limitations. RAID configurations

Unit III: Types of Storages: 15 hours

Magnetic storage: How magnetic fields are used to store data, read/write head design. Data encoding schemes; FM encoding, MFM encoding, RLL encoding, areal density, capacity measurements and perpendicular magnetic recording,magnetic disk media and floppy disk drives.**Hard Disk storage:** Hard drive advancements and form factors. Hard disk drive components and operation.Hard Disk features; capacity and performance.**Optical storage:**CD - DVD construction technology, DVD tracks and sectors, handling errors. Optical disk format; CD and DVD formats and copy protection, optical dive performance and trouble shooting. **Removable storage:** Role of removable Flash media drives; flash memory media, types of flash memory drives.

Unit IV: Video and Audio hardware: 15 hours

Video hard ware: Display adapters and monitors, integrated video/motherboard chipsets, video RAM and DAC. Video display interface, digital display interface, Monitors display specifications, LCD, CRT, OLED display technologies. Homogeneous and heterogeneous adapters, video capture devices, bad pixels,troubleshooting and maintenance.**Audio hardware:** Audio adapter concepts, evaluating the quality, sampling, installation sound cards. Troubleshooting sound card problems, onboard audio problems.Microphone, Speakersand their selection criteria

Recommended Books:

1. Upgrading and Repairing PCs. 20th Edition (with DVD) - Scott Mueller(Pearson Education)
2. PC Hardware-A Beginners Guide – Ron Gilster, (McGraw-Hill)
3. Principles of Computer Hardware,4th edition –Alan Clements(Oxford University Press)

Computer hardware –I Lab
Semester-V- DSE-503AP

Experiments List: **45 hours (3 hrs/week)**

1. Identification of Mother Board Components. (Processors, sockets, Chipsets, Connectors)
2. Keyboard, Mouse trouble shooting.
3. Making Serial, Parallel, Programming Cables, Crimping RJ45, Parallel Crimps.
4. Assembling and installing Computer.
5. Front panel interfacing.
6. BIOS Settings, configuration.
7. Updating BIOS.
8. Hard disk disassembly identifying internal parts
9. CD/DVD disassembly identifying internal components and troubleshooting.

Other Experiments as suggested by the teacher.

Nizam College (Autonomous)
Department of Physics
COMPUTER HARDWARE
Semester: V
DSE: 503B
VHDL
III YearB.Sc **60 hours (4hrs/week)**

Unit – I: Basics of VHDL and behavioral modeling **15 hours**

Introduction to HDL languages: Difference between HDL and other software languages, different HDL in vogue. Over view of digital system design using HDL.

Basic VHDL language elements: Identifiers, data objects, scalar and composite types, operators. Behavioural modeling with examples: Entity declaration, Architecture body, Process and sequential statements. Inertial and transport delay models, creating signal waveforms, signal drivers,

Unit – II: Data flow and structural modeling **15 hours**

Data flow modeling with examples: Concurrent signal assignment statement, concurrent vs. sequential signal assignment, delta delays, multiple drivers, conditional signal assignment statement, selected signal assignment, concurrent assertion statement.

Structural modeling with examples: Component declaration, component instantiation and all examples, direct instantiation of component.

Unit – III: Subprograms and packages: **15 hours**

Subprograms and overloading: Functions and procedures with simple examples- subprogram overloading – operator overloading.

Packages and libraries: Package declaration, package body, design file, design libraries, order of analysis, implicit visibility, explicit visibility, library clause and user clause.

Advanced features: Entity statements -generate statements, attributes, aggregate targets, ports and their behavior.

Unit – IV: Simulation and hardware modeling: **15 hours**

Model simulation: Simulation-writing a Test Bench for a half-adder and full-adder.

Hardware modeling examples: Modeling entity interfaces, modeling simple elements, different styles of modeling, modeling regular structures, modeling delays, modeling conditional operations, modeling a clock divider and a pulse counter.

Recommended books:

1. A VHDL Primer, J. Basker, 3rd Edition, PHI, New Delhi.
2. Circuit design with VHDL, VolneiPedroni, PHI, New Delhi, 2007.
3. Digital systems design using VHDL, Charles H Roth Jr, PSW Pub. 1998.
4. Introductory VHDL: From simulation to synthesis: SudhakarYalamanchili, Pearson Asia, 2001.
5. VHDL Programming by example, Douglas I Perry, TMH, 2002.
6. Fundamentals of digital logic with VHDL design, Stephen Brown & Z Vranesic, TMH, 2002.
7. VHDL- Analysis & modeling of digital systems, ZainaladedinNavabi, 2ndEdn TMH-1998.
8. The designer's guide to VHDL, Peter J Ashenden, 2nd Ed., Harcourt India Pvt. Ltd., 2001.

VHDL Lab
Semester-V
DSE: 503BP

Experiments List: **45 hours (3 hrs/week)**

VHDL-Program entry, simulation & implementation (CPLD/FPGA) using appropriate HDL software for the following circuits:

1. All types of Logic gates (data flow)
2. Half-adder (data flow, structural and schematic)
3. Full adder (data flow, structural and schematic)
4. Half subtractor (data flow, structural and schematic)
5. Full subtractor (data flow, structural and schematic)
6. Two control input Mux-using case
7. Two control input Mux-using conditional signal assignment
8. Two control input Mux-using selected signal assignment
9. Two control input De-muxusing case
10. BCD to seven segment Decoder (schematic)
11. Modeling a RS-FF with assertion, report & different levels (behavioural)
12. Modeling a BCD counter (top level behavioural)
13. Writing a test bench for a half adder/full adder.

Other Experiments as suggested by the teacher.

Nizam College (Autonomous)
Department of Physics
COMPUTER HARDWARE
Semester: VI
DSE-603A
Computer hardware-II

III YearB.Sc

60 hours (4hrs/week)

Unit I: Introduction to I/O interfaces: 15 hours

I/O interfaces: I/O ports, differences between serial and parallel ports, universal serial bus (USB), IEEE 1394, Hot-plugging and low speed external connections.
Input devices: Keyboards (101,104), Keyboard/mouse interface connectors, USB keyboards. Keyboard troubleshooting and repair. Pointing devices; ball type mice, optical mice and mouse troubleshooting. Wireless input devices and troubleshooting.

Unit II Internet and local area networking: 15 hours

Internet connectivity: Broadband internet access types, dialup modems, modern standard protocols, bits and baud rates, modulation standards, error-correction protocol, data compression and internet connection security.
Local area networking: Types of networks, Clint/server networks and peer-to-peer networks. Network architecture; wired Ethernet and wireless Ethernet and Bluetooth.Network protocol; IP and TCP/IP, IPX, NetBEUI. Setting up security and sharing internet connections.

Unit III:Power supply and upgrading systems: 15 hours

Power Functions: Positive DC voltage, negative DC voltage, power supply form factor, obsolete form factor, modern form factor. Power switches; ATX, PC/XT/AT and LPX. Motherboard power connectors (ATX and ATX 12V), compatibility and ATX design.Additional power connectors and specifications. Power use calculations, power cycling, power management and power supply troubleshooting and power-protections.
Upgrading systems: System components, processor, motherboard, memory, hard disk drives, removable storage, input devices and accessories. Motherboard installation, installation CPU and heat sink, installing memory modules, mounting new motherboard, connecting power supplies and other cables. Installing the drives, video card, other additional expansion cards, external cables and System startup.

Unit IV: PC testing and maintenance: 15 hours

PC diagnostics: the power-on self-test, peripheral diagnostics, operating system diagnostics, commercial and supported diagnostics. The boot process; hardware booting, DOS booting, Windows 9X booting and XP. PC maintenance tools, hand tools, safety, test equipment and special tools, active and passive maintenance, troubleshooting tips and techniques.

Recommended Books:

1. Upgrading and Repairing PCs. 20th Edition (with DVD) - Scott Mueller(Pearson Education)
2. PC Hardware-A Beginners Guide – Ron Gilster, (McGraw-Hill)
3. Principles of Computer Hardware,4th edition –Alan Clements(Oxford University Press)

Computer hardware-II lab
Semester-VI
DSE-603AP

Experiments List: **45 hours (3 hrs/week)**

1. Booting with Flash Drive.
2. Installing Drivers. Finding required Drivers.
3. Preparing Bootable OS Flash Drive
4. Preparing Bootable recovery Flash Drive
5. Data Backup and Recovery.
6. Local area Clint and sever networking
7. Setting up security
8. Operating system diagnostics
9. Power supply Troubleshooting.

Other Experiments as suggested by the teacher.

Nizam College (Autonomous)
Department of Physics
COMPUTER HARDWARE
Semester - VI
DSE-603B
Computer networks

III YearB.Sc **60 hours (4hrs/week)**

Unit-I Computer network: 15 hours

Introduction: Data Communication, Networks, Protocols and Standards, Topology, Categories of Networks, OSI Model,TCP/IP Protocol suites.
Physical Layer: Transmission modes, DTE-DCE Interface, Modems, Guided media, Unguided media, Performance, Multiplexing, Switching, DSL, FTTC.

Unit-IIData Link Layer: 15 hours

Data Link Layer: Data Link Control - Line discipline, Flow control, Error control; Data Link protocols– Asynchronous Protocols, Synchronous protocols, Character oriented protocols, Bit oriented protocols, Link Access Procedures.
LANS and MANS: Project 802, Ethernet, Token Bus, Token Ring, FDDI, Fast Ethernet, Giga bit Ethernet, DQDB, SMDS, PPP.

Unit –IIINetwork Layer: 15 hours

Network Layer: Repeaters, Bridges, Hubs, Switches, Routers, Gateways, Routing algorithms - Shortest path routing, Distance vector routing, Link state routing; X.25 layers and protocols, Congestion control - Leaky bucket algorithm, TCP/IP Protocol Suite- IP protocol, IP addresses, Sub-netting, IPv4, IPv6 ARP, RARP; ICMP, ISDN Services and channels, Broadband ISDN, ATM- Design goals, architecture and layers.

Unit-IV Transport and applications:15 hours

Transport Layer: Responsibilities of Transport layer, Transport connection, OSI Transport protocol, TCP, UDP
Application Layer: BOOTP and DHCP, DNS, TELNET, FTP, SMTP, HTTP, WWW, VoIP, Four aspects of Network security, Privacy, Digital Signatures.

Recommended Books:

1. Data Communications and Networking,BehrouzaForouzan 2nd Edition, Tata McGraw-Hill, New Delhi, 2003
2. Computer Networks,Andrews Tanenbaum, 4th Edition, Prentice-Hall of India, New Delhi, 2000.
3. Data and Computer Communication,William Stallings, 6th Edition, Prentice Hall of India, New Delhi, 1999.
4. Computer Networks and Internet, Douglase Comer Pearson Education Asia, 2000.

Computer networks Lab

Semester-VI -DSE-603BP

Experiments List: **45 hours (3hrs/week)**

1). Understanding Networks.
2). Preparing cables, crimping.
3). Configuring IP.
4). Creating LAN.
5). Sub netting
6). Configuring Network Devices.
7). Interconnecting LANs
8). Creating Wireless Network
9). Configuring Wireless Router/bridge/repeater

Other experiments as suggested by the teacher