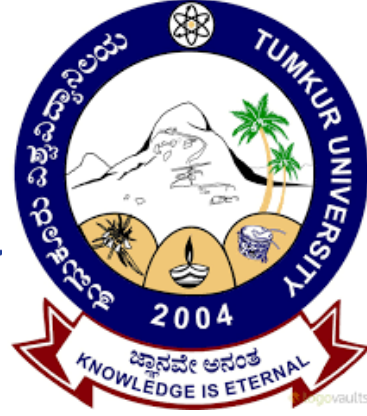




ज्ञान-विज्ञान विमुक्तये

UGC



Tumkur University

University Grants Commission- UGC
Sanctioned under XIIth plan of guidelines

Job Oriented Skill Based Vocational Degree Course
under National Skill Qualification Framework (NSQF)

in

B.Voc (Hardware Technology and Networking)

Course Syllabus 2016-17 academic years onwards

UGC -B. VOC (HARDWARE TECHNOLOGY & NETWORKING)

First Semester –SEM I

Sl. No.	Type & Title of the Paper.	Paper Code	Instructions (Hrs/week)	No. of Credits	Duration of the Exam	Max Marks		
						IA	Sem. End Exam	Total Marks
1	General English	GEC-1.1T:	4	4	3 Hrs	10	90	100
	Industrial Visit	-	-	2	-	-	-	-
2	Basics of Computer Systems	GEC-1.2T	4	4	3 Hrs	10	90	100
	Basics of Computer Systems Lab	GEC-1.2P	4	2	3 Hrs	-	50	50
3	Computer Hardware & Maintenance	SDC-1.3	4	4	3 Hrs	10	90	100
	Computer Hardware & Maintenance Lab	SDC-1.3P	4	2	3 Hrs	-	50	50
4	Operating System	SDC-1.4T	4	4	3 Hrs	10	90	100
	Operating System Lab	SDC-1.4P	4	2	3 Hrs	-	50	50
5	Basics of Networking	SDC- 1.5	4	4	3 Hrs	10	90	100
	Basics of Networking Lab	SDC- 1.5P	4	2	3 Hrs	-	50	50
				30		50	650	700

Second Semester-Sem 2

Sl. No.	Type & Title of the Paper	Paper Code	Instructions (Hrs/ week)	No. of Credits	Duration of the Exam	Max.Marks		
						IA	Sem. End Exam	Total Marks
1	Applied Science	GEC-2.1T	4	4	3 Hrs	10	90	100
	Industrial Visit	-	-	2	-	-	-	-
2	Basics of Electronics and Measuring Instruments.	GEC-2.2T	4	4	3 Hrs	10	90	100
	Basics of Electronics and Measuring Instruments Lab	GEC-2.2p	4	2	3 Hrs	-	50	50
3	Hardware Concepts -I	SDC-2.3T	4	4	3 Hrs	10	90	100
	Hardware Concepts -I Lab	SDC-2.3P	4	2	3 Hrs	-	50	50
4	Computer Network and Maintenance	SDC-2.4T	4	4	3 Hrs	10	90	100
	Computer Network and Maintenance Lab	SDC-2.4P	4	2	3 Hrs	-	50	50
5	Basics of Windows server 2003	SDC-2.5T	4	4	3 Hrs	10	90	100
	Basics of Windows server 2003 Lab	SDC -2.5P	4	2	3 Hrs	-	50	50
				30		50	650	700

Third Semester-Sem 3

Sl. No.	Type & Title of the Paper	Paper Code	Instructions (Hrs/ week)	No. of Credits	Duration of the Exam	Max.Marks		
						IA	Sem. End Exam	Total Marks
1	GEC-3.1: Basics of Communication Skills	GEC-3.1T	4	2	3 Hrs	10	90	100
	Industrial Visit	-	-	2	-	-	-	-
2	GEC-3.2: Principles of Digital Electronics	GEC-3.2T	4	4	3 Hrs	10	90	100
	GEC-3.2: Principles of Digital Electronics Lab	GEC-3.2p	4	2	3 Hrs	-	50	50
3	SDC-3.3: Hardware Concepts -2	SDC-3.3T	4	4	3 Hrs	10	90	100
	SDC-3.3: Hardware Concepts -2 Lab	SDC-3.3P	4	2	3 Hrs	-	50	50
4	SDC-3.4: Networking Concepts -I Through Java Programming	SDC-3.4T	4	4	3 Hrs	10	90	100
	SDC-3.4: Networking Concepts -I Through Java Programming Lab	SDC-3.4P	4	2	3 Hrs	-	50	50
5	SDC-3.5: Micro processor 8085 and Its Applications	SDC -3.5T	4	4	3 Hrs	10	90	100
	SDC-3.5: Micro Processor 8085 and Its Applications Lab	SDC -3.5P	4	2	3 Hrs	-	50	50
				30		50	650	700

Fourth Semester -SEM 4

Sl. No.	Type & Title of the Paper.	Paper Code	Instructions (Hrs/week)	No. of Credits	Duration of the Exam	Max Marks		
						IA	Sem. End Exam	Total Marks
1	GEC-4.1: Basic ICT skills	GEC-4.1T	4	4	3 Hrs	10	90	100
	Industrial Visit	-	-	2	-	-	-	-
2	GEC 4.2: Programming using Python	GEC-4.2T	4	4	3 Hrs	10	90	100
	GEC 4.2: Programming using Python Lab	GEC-4.2p	4	2	3 Hrs	-	50	50
3	SDC-4.3: Hardware Concepts -III	SDC-4.3T	4	4	3 Hrs	10	90	100
	SDC-4.3: Hardware Concepts -III Lab	SDC-4.3P	4	2	3 Hrs	-	50	50
4	SDC-4.4: Networking Concepts -II Through Java programming	SDC-4.4T	4	4	3 Hrs	10	90	100
	SDC-4.4: Networking Concepts -II Through Java Programming	SDC-4.4P	4	2	3 Hrs	-	50	50
5	SDC-4.5: 8051 Micro Controllers and Its Interfacing	SDC- 4.5T	4	4	3 Hrs	10	90	100
	SDC-4.5: 8051 Micro Controllers and Its Interfacing lab	SDC -4.5P	4	2	3 Hrs	-	50	50
				30		50	650	700

Fifth Semester -SEM 5

Sl. No.	Type & Title of the Paper.	Paper Code	Instructions (Hrs/week)	No. of Credits	Duration of the Exam	Max Marks		
						IA	Sem. End Exam	Total Marks
1	GEC-5.1 : BPO Skills	GEC-5.1T	4	4	3 Hrs	10	90	100
	Study Tour/Industrial Visit		-	2	-	-	-	-
2	GEC-5.2: LINUX System Monitoring and Performance Tuning	GEC5-.2T	4	4	3 Hrs	10	90	150
	GEC-5.2: LINUX System Monitoring and Performance Tuning	GEC-5.2p	4	2	3 Hrs	-	50	50
3	SDC-5.3: SDC-5.3 INSTALLING AND CONFIGURING WINDOWS SERVER 2012	SDC-5.3T	4	4	3 Hrs	10	90	150
	SDC-5.3 INSTALLING AND CONFIGURING WINDOWS SERVER 2012 lab	SDC-5.3P	4	2	3 Hrs	-	50	50
4	SDC- 5.4: Certified Ethical Hacking(CEH)	SDC-5.4T	4	4	3 Hrs	10	90	150
	Certified Ethical Hacking(CEH) Lab	SDC-5.4P	4	2	3 Hrs	-	50	50
5	SDC- 5.5: Embedded Systems	SDC -5.5T	4	4	3 Hrs	10	90	150
	Mini Project	SDC -5.5P	4	2	3 Hrs	-	50	50
				30		50	650	700

***** Indian Constitution a compulsory paper for UG course in this semester**

Sixth Semester SEM 6

Sl. No.	Type & Title of the Paper.	Paper Code	Instructions (Hrs/week)	No. of Credits	Duration of the Exam	Max Marks		
						IA	Sem. End Exam	Total Marks
1	GEC-6.1 : VLSI Design	GEC-6.1T	4	4	3 Hrs	10	90	100
	Industrial visit		-	2	-	-	-	-
2	GEC-6.2 : LINUX Enterprise Clustering and Storage Management	GEC-6.2T	4	4	3 Hrs	10	90	150
	GEC-6.2 : LINUX Enterprise Clustering and Storage Management Lab	GEC-6.2p	4	2	3 Hrs	-	50	50
3	SDC-6.3: LINUX Enterprise Deployment and Systems Management Course	SDC-6.3T	4	4	3 Hrs	10	90	150
	LINUX Enterprise Deployment and Systems Management Course Lab	SDC-6.3P	4	2	3 Hrs	-	50	50
4	SDC- 6.4: Internet of Things(IOT)	SDC-6.4T	4	4	3 Hrs	10	90	150
	SDC- 6.4: Internet of Things(IOT)Lab	SDC-6.4P	4	2	3 Hrs	-	50	50
5	PD-6.5: Project & Dissertation	SDC -6.5P	4	6	3 Hrs	-	150	150
				30		40	660	700

**** Environmental Studies (EVS) compulsory paper in this semester**

GEC: General Educational Component

GECP: General Educational Component Practical

SDC: Skill Development Component

SDCP: Skill Development Component Practical

FWP: Field Work Practical/Industrial Visit

PD: Project & Dissertation

Question Paper Pattern

Duration: 3 Hrs. Max. Marks: 90

- I. Answer any 10 Questions out of 12: (10 x 01 = 10)
- II. Answer any 5 questions out of 07: (05 x 03 = 15)
- III. Answer any 6 questions out of 08: (06 x 05 = 30)
- IV. Answer any 5 questions out of 07: (05 x 07 = 35)

Scheme for Practical Examination

- 1. Writing two programs: 10 Marks
- 2. Execution of two programs: 30 Marks
- 3. Practical record: 05 Marks
- 4. Viva Voce: 05 Marks

Total :50 Marks

Note

- 1. Internal assessment for each paper (Theory) :10 Marks
- 2. Practical Examination of 3 hours duration: 50 Marks
- 3. Theory Examination of 3 hours duration: 90 Marks

Total: 150 Marks

I Semester

GEC-1.1: GENERAL ENGLISH

4 Hrs/Week

Total Credits: 04

Total Hours:60

Unit I

(1 Credits)

I. Pros:

- 1) The Bet – Anton Chekov
- 2) Socrates and the Schoolmaster – F. L. Brayne
- 3) An Astrologer’s Day – R. K. Narayan
- 4) The Gift of the Magi – O’ Henry
- 5) With the Photographer – Stephen Leacock

Unit II

Spoken Communication:

(2 Credits)

- 1) Meeting People, Exchanging Greetings and Taking Leave
- 2) Introducing Yourself
- 3) Introducing People to Others
- 4) Answering the Telephone and Asking for Someone
- 5) Dealing with a Wrong Number
- 6) Taking and Leaving Messages
- 7) Making Inquiries on the Phone
- 8) Calling for Help in an Emergency

Unit III.

Grammar and Vocabulary:

(1 Credit)

Articles, prepositions, modal auxiliaries, antonyms, synonyms, one-word substitutes

Written Communication:

Summarizing

Text Book

1. “Prism: Spoken and Written Communication, Prose & Poetry”, published by Orient Longman.

GEC-1.2: BASICS OF COMPUTER SYSTEMS**4 Hrs/Week****Total Credits: 04****Total Hours: 60****Unit 1: Introduction to Computers****(01credits)**

Definition of Computer, Block diagram of a Computer System, I/O devices and Storage devices. Representation of integers, real (fixed and floating point), characters. Functional units – Basic operational concepts – Bus structures – Performance and metrics – Instructions and instruction sequencing – Hardware – Software Interface – Instruction set architecture – Addressing modes – RISC – CISC. ALU design – Fixed point and floating point operations. Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control – Nano programming.

Unit 2: Pipelining**(01credits)**

Basic concepts – Data hazards – Instruction hazards – Influence on instruction sets – Data path and control considerations – Performance considerations – Exception handling.

Unit 3: Memory System**(01credits)**

Basic concepts – Semiconductor RAM – ROM – Speed – Size and cost – Cache memories Improving cache performance – Virtual memory – Memory management requirements Associative memories – Secondary storage devices.

Unit 4: I/O Organization**(01credits)**

Accessing I/O devices – Programmed Input/output -Interrupts – Direct Memory Access Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB), I/O devices and processors.

Text Book

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", Fifth Edition, Tata McGraw Hill, 2002.

References

1. David A. Patterson and John L. Hennessy, "Computer Organization and Design: The Hardware/Software interface", Third Edition, Elsevier, 2005.
2. William Stallings, "Computer Organization and Architecture – Designing for Performance", Sixth Edition, Pearson Education, 2003.
3. John P. Hayes, "Computer Architecture and Organization", Third Edition, Tata McGra

w Hill, 1998.

4. V.P. Heuring, H.F. Jordan, "Computer Systems Design and Architecture", Second Edition, Pearson Education, 2004.

BASICS OF COMPUTER SYSTEM LAB

List of Practical:

2 credits (30 hours)

- 1) Write a assembly level program to illustrate swapping of two numbers?
- 2) Write a assembly level program to illustrate the branch instruction?
- 3) Write a assembly level program to find largest of three numbers?
- 4) Write a assembly level program to find the number of digits in a number?
- 5) Write a assembly level program to find the sum of first n odd natural numbers?
- 6) Write a assembly level program to display multiplication table of any number?
- 7) Write a assembly level program to find the product of first 7 natural numbers?
- 8) Write a assembly level program to find the sum of first n even whole numbers?
- 9) Write a assembly level program to find the factorial of a numbers?
- 10) Write a assembly level program to find the area and perimeter of rectangle?
- 11) Write a assembly level program to find the sum of first n natural number?
- 12) Write a assembly level program to find the number is even or odd and display '0' if the number is even or '1' if the number is odd?
- 13) Write a assembly level program to find the power of a number

SDC-1.3: COMPUTER HARDWARE & MAINTENANCE

4 Hrs/Week

Total Credits: 04

Total Hours: 60

Unit I

(1 Credit)

BASIC COMPUTER SYSTEM & PERIPHERALS:

Input & Output Devices, their types and specifications, CPU, Memory devices- types primary and secondary.

MOTHER BOARD:

Study of Motherboard RAM, ROM, CMOS, POST, BUS, (Address, Data, SYSTEM) Connections of various devices such as Display Adapter, Ports (Serial, Parallel, USB)& Modem on the Mother Board. Importance of CPU cooling, Motherboard trouble shooting.

Unit II**(1 Credit)**

SERIAL DEVICES:-

- a. Key Board: Switches, Keyboard organization, Key board type, Wireless Keyboard Trouble shooting.
- b. Mouse: Mouse type- Scroll & Optical Mouse, Function Connecting Mouse, Trouble shooting Mouse.
- c. Ports d. Modems.

Unit III**(1 Credit)**

STORAGE DEVICES:-

- a. HDD: HDD types, integrated, SCSI, Magnetic recording, Formatting(Track, Sector) Cluster, Defragmentation , Bad Sector, Jumper Setting, Common Problem and its trouble Shooting, External Drive (HDD), Optical Drives.
- b.FDD: FDD types and working and its related problem.
- c. CD and DVD drives- ROM and Writer, COMBO drives, , Mass Storage Devices.
- d. USB Devices: Hub, Pen Drives .

Unit IV**(1 Credit)**

PARALLEL DEVICES:-

- a. Printers: Working of DMP, Ink Jet, Laser Printer, line printer, MFP (Multi Functional Printer and its Trouble shooting).
- b. Scanners-Working method and its trouble shooting.
- c. Plotters

TYPES OF SOFTWARE- System Soft Windows and other S/w & Anti Virus

BOOT PROCESS: Setting of CMOS, Setup 11

POWER SUPPLY: Operating characteristics, Types and maintenance.

TYPES OF PC'S: Desktop, Laptop, Palmtop, BIOS/ CMOS setting.

PC TOOLS.

List of Practical:**2 Credits (30 hours)**

1. Study of devices on motherboard
 - a. RAM
 - b. AGP Slot
 - c. PCI Slots
 - d. CPU
 - e. Chipset
 - f. Motherboard Connections
2. Study of Key board
 - a. Keyboard architecture & layout
 - b. Keyboard decoder

3. Study of Computer display
 - a. Video Adopter
 - b. Display controllers
4. Study of Storage devices/Drives
 - a. Hard disk drive
 - b. Floppy disk drive
 - c. Pen drive
 - d. CD-Rom drive
5. Troubleshooting the following equipment
 - a. Dot Matrix Printer
 - b. Laser Printer
 - c. Inkjet Printer
 - d. Laser Plotter
 - e. Scanner

SDC-1.4: OPERATING SYSTEM

4 Hrs/Week

Total Credits: 04

Total Hours: 60

Unit I

(1 Credit)

1. INTRODUCTION -What is O.S., Multiprogramming, Time Sharing, Real Time System, and Multitasking.
2. FILE SYSTEM: Types of file Sequential, index, direct access, creation and updates of file and access method. Directory system.

Unit II

(1 Credit)

3. C.P.U. & DISK, Drum Scheduling. Scheduling concepts, Scheduling Algorithm, Multiprocessor, FCFS Scheduling.
4. MEMORY MANAGEMENT Swapping, multiple partitions, Paging, Segmentation, virtual memory, Demand paging, page replacement.

Unit III

(1 Credit)

5. FEATURES OF WINDOWS- Types of Window – XP/ 2000/Vista & differences, Boot Process, Configuring, Installation, GUI, What is interface, Windowing, windows environment, menus of Dialog boxes, Concepts of Icon,

Unit IV

(1 Credit)

6. Basic Windows Security System. Functions of Programs, Documents, Setting, Run Command. LINUX – Installation, File System, Tools and Commands, RHL. LAMP.

List of Practical**(2 Credits)****Windows 98**

Discussion on Dos Architecture

1. Command line Interface (DOS)Operations
2. External Commands
3. Command Line Interface(Linux)
4. The Start Menu options
5. Using the Explorer Window
6. Creating User Accounts in windows
7. Control Panel options (System and Security, Windows Update, Windows Update, Windows Firewall)
8. Internet options(Manage Computer)
9. FCFS cpu scheduling Algorithm
10. Round Robin Scheduling Algorithm.

Windows 2000

Discussion on Difference between Windows 98, Windows-2000 and Windows NT

11. Installing windows 2000
12. Looking supporting files & installing drivers
13. Installing applications

Windows XP

Discussion on difference between Windows -2000 and Windows XP

14. Installing windows XP
15. Looking supporting files & installing drivers
16. Installing applications
17. Practice on service Packs in XP
18. Practice on Home, Professionals editions
19. Practice on architecture of OS-32-Bit, 64-Bit

SDC-1.5 BASICS OF NETWORKING**4 Hrs/Week****Total Credits: 04****Total Hours: 60****Unit I****(1 Credit)**

BASICS OF DATA COMMUNICATION: Types of Data, Difference of Data & Information.
DATA TRANSMISSION: Analog Transmission, Digital Transmission. Five Components of data transmission, characteristics of data communication, Modes of data Transmission-

Simplex Half duplex / Full Duplex, Synchronous & Asynchronous Data Communication.
Types of Network-LAN, MAN, WAN.

Unit II**(1 Credit)**

TRANSMISSION MEDIA: STP (Shielded Twisted Pair), UTP (Unshielded Twisted Pair), Coaxial Cable, Cabling Standards for LAN using UTP Cable, How to do Crimping, Building Straight through Cable and Cross Cables, Testing Cable Continuity.

Twisted pair, Coaxial Cable, Optical Fibers, Wireless Transmission, Microwave, Radio Waves and their respective connectors, IEE standards.

PROTOCOLS AND ARCHITECTURE: OSI reference models, TCP/IP Protocol suit.

Unit III**(1 Credit)**

DATA LINK CONTROL AND PROTOCOL: Flow Control - Stop and Wait, Sliding window, Error Detection, by parity & CRC, Error correction, humming code, HDLC.

LOCAL AREA NETWORK : LAN architecture, LAN topologies - Bus/Tree LAN, Ring LAN, Star LAN, Wireless LAN, Ethernet and Fast Ethernet (CSMA/CD), Token Bus, token ring and FDDI.

NETWORKING DEVICES- Hub, switch, Bridge, Routers, Repeaters, gateways, Modems.

NETWORK LAYER- Introduction , Routers, Routing Algorithms, Congestion, Sub networking and Class Less Inter Domain (CCIDR),

NAT and PAT, Control algorithm, IP Addressing, DNS, Modulation – AM, FM, PM, QAM, Modem Wavelength multiplexing- FDM, TDM, WDM.

Unit IV**(1 Credit)**

Working of Internet- Web Server, Browser, HTTP, HTTPS, Web Services, Internet Architecture, IIS, Web Application's/w Security – Cryptography

TRANSPORT PROTOCOLS: Transport services, TCP, UDP.

WIDE AREA NET WORKS: WAN, Circuit switching, Packet switching, Frame relay, ATM, ISDN.

BASIC VIDEO CONFERENCING, Tele Conferencing, Mobile Computing, DAMA, PAMA, Types of Cameras and Micro phones.

List of Practical**(2 Credits)****1. BASICS OF NETWORKING**

- 1) Create a LAN using
 - a. Star topology
 - b. Ring topology
- 2) Connect and understand following network devices used in LAN.
 - a. HUB
 - b. Switch
 - c. Routers

- 3) Study of constructional details of transmission media
 - a. Coaxial cable
 - b. Twisted pair cable
 - c. Optical fiber
- 4) To connect network cable using RJ 45 connector.
- 5) Connect two hubs by using cross over cable.
- 6) Installing Network Interface Card.
- 7) Install and configure property of TCP/IP protocol.
- 8) Locate the MAC address of the computer.
- 9) Installation of network printer.
- 10) Installation of IIS [HTTP server].
- 11) Configure web server and client machine.
- 12) Connection via remote application.

GEC-2.1: APPLIED SCIENCE

4 Hrs/Week

Total Credits: 04

Total Hours:60

Unit-I

(1 Credit)

Units, Dimensions and Measurement:

Physical quantities, Systems of units, Advantages of SI, Dimensions, Dimensional formula and its Applications, Principle of Vernier, its usage, Principle of Screw gauge, its usage-Problems.

Basics of Dynamics:

Equations of motion, Newton's laws of motion, Force, Inertia, Momentum, Law of conservation of momentum, Simple problems. Friction, Advantages and disadvantages.

Basics of Statics:

Scalars, Vectors, Resultant, Equilibrium, Resolution of Vectors. Laws of Vectors (Parallelogram law, Triangle law, Lami's theorem, and Polygon law) Simple problems.

Co-planar parallel Forces, Moment of Force, Couple, Moment of Couple, Parallel Forces, Conditions of Equilibrium, Simple problems.

Unit-II

(1 Credit)

Properties of Solids and Liquids:

Plasticity and Elasticity, Types of Stress and Strain, Hooke's Law, Types of elasticity, Compressibility, Poisson's ratio, Factor of safety, simple problems.

Liquid pressure, Cohesive and Adhesive forces, Angle of contact, Surface Tension and its Application, Capillarity and its Applications, Viscosity and its Applications, simple problems.

Heat and Properties of Gases:

Heat and Temperature, Specific Heat, Heat Capacity, Specific heats of gases, C_p and C_v relation between them, Gas laws-Boyle's law, Charles's law, absolute scale of temperature, Perfect gas equation, simple problems.

Unit-III

(1 Credit)

Wave Motion:

Basic definitions of vibratory motion, SHM, Wave motion, Types of waves, Stationary Waves and its Characteristics, Resonance, Beats and its applications, Velocity of sound in gas, affecting factors, Laws of transverse vibrations of stretched string, Acoustics of building-Echo, Reverberation, simple problems.

Physical Optics:

Introduction to theories of light- Newton's corpuscular theory, Huygen's wave theory, Maxwell's electromagnetic theory, Planck's quantum theory.

Interference- Theory of interference, Expression for amplitude and intensity of resultant wave, conditions for constructive and destructive interference, expression for path difference and fringe width, simple problems on fringe width and path difference.

Diffraction- Fresnel's diffraction, Fraunhofer's diffraction, difference between interference and diffraction, Resolving power, expression for resolving power of microscope and telescope.

Polarisation-Plane of vibration, plane of polarization, methods of producing plane polarized light, Brewster's law.

Unit-IV: Modern Physics:

(1 Credit)

Electron emission-Thermionic emission, Photoelectric emission, Field emission and secondary emission, Experimental results of photoelectric effect, Einstein's photoelectric equation, Photoelectric cell and its applications, scattering of light, coherent scattering and incoherent scattering, Raman effect-applications.

Laser- Principle, necessary conditions, properties and applications of laser,

Radioactivity- properties of α , β and γ rays.

GEC-2.2: BASICS OF ELECTRONICS & MEASURING INSTRUMENTS**4 Hrs/Week****Total Credits: 04****Total Hours: 60****Unit I****(1 Credit)**

PASSIVE COMPONENTS- Resistors, Capacitors, Inductors, Transformers – Types, Working and Properties. Voltage and Current Sources.

SEMICONDUCTOR PHYSICS

Analyzing conductivity of elements, Types of conductors, Pure (intrinsic) semiconductors-Silicon, Germanium: Thermal Generation (formation of charge carrier-Positive & Negative charge carriers i.e. electron-hole pair) , p-n junction.

SEMICONDUCTORS DIODES:

Effect of applying electrical potential across a P-N Junction in the following ways:
Positive of the source to 'P' type terminal & Negative to the 'N' type terminal
Positive of the source to 'N' type terminal & Negative to the 'P' type terminal.

Unit II**(1 Credit)**

Half wave rectifier, Full wave rectifier using C.T. '1 transformer, using bridge circuits)
Special purpose diodes: Zener diode, Vactor diode, Photo Diode, Light emitting Diode (LED), their characteristics and uses.

TRANSISTORS:

Growing a Crystal having two P-N Junction back to back (ie.PNP & NPN) Junction transistor structure transistor action of transistor in FF,RR,FR and RF biasing; working of transistor relation between different currents in a transistor
Various configurations of transistor (CB,CE, CC);relation between. Transistor action in three configurations; Comparison between the three configurations of transistor;
Field - Effect transistor (JFET, IGFET, MOSFET), Photo Transistor
Biasing of Transistor

Unit III**(1 Credit)****INTEGRATED CIRCUITS:**

Introduction. Manufacturing proc ssp SSI, MSI, LSI, VLSI, ICs. Linear and Digital ICs. Switching and Gating ICs DTL, TTL, ICs.

REGULATED POWER SUPPLY

Basic regulator using Zener Diode, IC based power supplies Block diagram major specification, pin configuration their measurements, Basic of switch mode power supply (SMPS) ,Basic of uninterrupted power supply

Unit IV**(1 Credit)**

Concept and Practices of Earthling.

BASIC MEASURING INSTRUMENTS.

Millimetres – Electronics & Digital – Basic principles of measurement & significance of specifications

Cathode Rays Oscilloscope – Block diagram & basic working, specification & their significance, Different uses of CRO, Different types of CRO – dual trace, delayed sweep & storage (Brief introduction)

Impedance Bridge, Q Meters – Basic working principle of simple RLC & Digital RLC bridges. Working principle of Q Meter, Measurement by all given device.

List of Practicals**(2 Credits)**

1. Ohm's Law verification.
2. To verify laws of series of parallel connection of resistance.
3. Simple circuits showing the use of capacitance and inductance.
4. Study of transfer, its use in left type of circuits.
5. Semiconductor diode characteristics.
 - 5.1 Identifications of types of packages, terminals and noting different ratings using data books for various types of semiconductor diodes (Germanium, point contact, silicon low power and high power and switching diode)
 - 5.2 Plotting of forward V-I characteristics for a point contact and junction P-N diode (Silicon & Germanium diode)
6. Rectifier Circuits using semiconductor diode, measurement of input and output voltage and plotting of input and output wave shapes.
 - 6.1 Half wave rectifier
 - 6.2 Full wave rectifier (center tapped and bridge rectifier circuits.)
7. To plot forward and reverse V-I characteristics for a zener diode.
8. To plot wave shapes of a full wave rectifier with shunt capacitor , series inductor and filter circuits.
9. To plot the input and output characteristics and calculation of parameters of a transistor in common base configuration.
10. To plot input and output characteristics and calculation of parameters of a transistor in common emitter configuration.
11. Transistor Biasing circuits.
 - 11.1 Measurement of operating point (I_c & V_{ce}) for a fixed bias circuit.
 - 11.2 Potential divider biasing circuits.
12. Plot the FET characteristic and determination of its parameters from these

characteristics.

SDC-2.3: ADVANCED HARDWARE CONCEPTS

4 Hrs/Week

Total Credits: 04

Total Hours: 60

Unit - I (2 Credit)

Keyboard and mouse interfaces, Display - Video and LCD displays -CRT controller - Graphics controller, Audio / Video cards, printers, Interface standards – Serial-PS2,Floppy Disks - controllers and Standards - Hard disks - Formats, Controllers and Interface Standards-SCSI-PCI-ATA-XTA- High capacity Magnetic storage techniques - RAID.

Unit-II (1 Credit)

Personal Computer Architecture - IBMPC, PC/XT, PC/AT System, configuration - ROM BIOS - device drivers, Introduction to other, personal computers/workstations/network computers.

Unit III (1 Credit)

Standards in PC Architecture – BUS standards, System Bus, communication Interface, Plug and play Systems.

Unit-IV (1 Credit)

Hardware and Software diagnostic tools –Benchmarks –Toy Benchmarks - Power on self test -Data recovery utilities.

References:

1. Mueller.S, Upgrading and repairing PCS, 4th Edition, Prentice Hall,1995.
2. Govindarajulu.B, IBM PC and Clones Hardware trouble shooting and maintenance McGraw Hill, 1993.
3. Rosch, Winn Rosch Hardeare Bible, 2nd Edition, B.P.B, Publication Ltd.,1996.
4. D.V.Hall, Microprocessors and Interfacing Programming and Hardware, Mc Graw Hill,1986.

Hardware Lab (1 Credits)

- 1) Connecting & disconnecting computer peripherals and components & driver installation
- 2) Hard disk partitioning and formatting
- 3) O.S installation like 95, 98, 2000, 2003
- 4) NTFS O.S installation like Linux, UNIX
- 5) Internal component assembling and dissembling
- 6) Basic trouble shoots using beep code

7) Dual O.S installation

SDC-2.4: COMPUTER NETWORK AND MAINTENANCE

4 Hrs/Week

Total Credits: 04

Total Hours:60

Unit – I (1 Credit)

Different Transmission Medias – Ethernet Cards and Standards –Connectors RJ45 – Cross-cabling and Direct cabling.

Unit – II (1 Credit)

Networking Components – Hubs –Bridges – Switches – Switching and Forwarding Routers – Brouters – Gateways. Addressing – Sub netting – Domain concepts.

Unit-III (1 Credit)

Overview of UNIX OS - File I/O – File Descriptors – File sharing – Files and directories – File types - File access permissions – File systems, Introduction - Message passing (SVR4)- pipes – FIFO message. queues - Mutexes – condition variables – read – write locks – file locking – record locking – semaphores –Shared memory(SVR4).

Unit –IV (1 Credit)

Introduction – transport layer – socket introduction - TCP sockets –UDP sockets - raw sockets – Socket options - I/O multiplexing – Name and address conversions.

References:

1. W.Richard Stevens, Advanced programming in the UNIX environment, Addison Wesley, 1999.
2. W.Richard Stevens, UNIX Network Programming Volume 1, 2, Prentice Hall International, 1998.
3. William Stallings, Data and Computer Communications, 5th edition, PHI,1997.
4. Andrew Tanenbaum Computer Networks PHI.

UNIX AND NETWORK PROGRAMMING LAB

(2 Credits)

1. Program using system calls: create, open, read, write, close,
2. stat, fstat, lseek
3. Program to implement inter process communication using pipes
4. Program to perform inter process communication using message
5. queues
6. Program to perform synchronization using semaphores
7. Program using TCP sockets (Client and Server)
8. Program using UDP sockets (Client and Server)

9. Program to implement a chat server using TCP/IP protocol
10. Program to implement FTP
11. Simulation of Sliding Window Protocol
12. Simulation of Routing Protocols
13. Implementation of RPC
14. Implementation of DNS
15. Implementation of HTTP
16. Program to create sockets for handling multiple connections
17. Perform socket programming using java
18. Program to trace the port of a particular host
19. Ping program

SDC -2.5: BASICS OF WINDOWS SERVER 2003

4 Hrs/Week

Total Credits: 04

Total Hours: 60

Unit I

(1 Credit)

MS Windows Operating Systems, Introduction MS Windows Operating Systems, Features of Windows XP Professional, Installing MS Windows XP Professional, System requirements, Using Remote Installation Services, Using System Preparation Tool, Create unattended answer files to automate the installation.

Unit II

(1 Credits)

Users and Groups, Administering Users and Groups, Creating user accounts, Configuring user account properties, Implementing security for user accounts, Creating Groups (Local and Domain), Configuring Group membership, User Profiles
Administering Printers ,Installing and Managing, Printers Configuring Printers, Internet printing,Monitor, Manage and troubleshoot access to Files and Folders ,Configure file compression, Control access to files and folders using permissions Optimize access to files and folders,Monitoring Performance and System Events Using Task manager and Event Viewer , Using System Monitor and Performance Logs .

Unit III

(1 Credit)

MS Windows Server 2003,Installing MS Windows Server 2003, System requirements, Installation procedure, Windows Server 2003 Boot Process I Disc Management ,Physical Discs – understanding ARC Path Designation, Basic vs. Dynamic Disks , Disk Management Tools and Tasks, Concept of RAID .

Backups and Recovery

Administering Disaster Recovery, Need and Types of Backup, Using Backup Utility, Scheduling Backups , Restoring Data, Troubleshooting Boot Failures, Automated System

Recovery (ASR) ,Installing and Configuring Terminal Services ,Terminal Services Overview, Remote Desktop Connection.

Prescribed Books:

1. Harwood, Jason Berg MCSE 4 in One Study System Dream tech Press, New Delhi.
2. Walter Glenn Users and Troubleshooting Desktop Applications on windows XP OS Microsoft Windows Server 2003.
3. Sharon Crawford Administrator's Companion Microsoft Press.

Lab Exercises

(2 Credits)

1. Installing Windows Server 2003 R2 and Configuration
2. Installing Windows Server 2003 SP1
3. Performing Post-Installation Configuration of Windows Server 2003 SP1
4. Configuring the Server
5. Install a Network Adapter
6. Set Driver Signing Options, Return the Computer to its Default Configuration
7. Creating a Partition Using Disk Management Snap-In
8. Converting a Disk from Basic to Dynamic Storage from the Disk Management Snap-n
9. Using DiskPart,Extending Volumes Using Disk Management
10. Drive Letters and Mounted Volumes
11. Configuring Default Disk Quota Settings
12. Creating Custom Quota Entries for Users
13. Configuring the Security Log
14. Setting File and Object Auditing
15. Reading the Security Log
16. Importing Logged Data decoding Performance Data

GEC-3.1: Basics of Communication Skills

4 Hrs/Week

Total Credits: 04

Total Hours:60

Unit I

(1 Credit)

Introduction to Communication: Purpose of Communication; Process of Communication; Importance of Communication in Business; Differences between Technical and General Communication; Barriers to Communication; Measures to Overcome the Barriers to Communication.

Types of Communication: Types of Communication; Verbal Communication-Importance of verbal communication- Advantages of verbal communication-

Advantages of written communication; Significance of Non-verbal Communication

Listening Skills: Listening Process; Classification of Listening; Purpose of Listening; Common Barriers to the Listening Process; Measures to Improve Listening; Listening as an Important Skill in Work Place.

Language and Communication: Language and Communication; General Principles of Writing; Improving Writing Skills, Essentials of good writing style, Expressions and words to be avoided; Grammar and Usage

Unit II

(1 Credit)

Communication in Organizations: Internal Communication; Stake Holders in Internal Communication; Channels of Internal Communication; External Communication; Stake Holders in External Communication; Channels of External Communication

Communication Network: Scope and Types of Communication Network; Formal and Informal Communication Network; Upward Communication; Downward Communication; Horizontal Communication; Diagonal Communication.

Writing Business Letter: Importance of Business Letters; Difference between Personal and Business Letters; Structure and Format of Business Letters; Types of Business Letters.

Unit III

(1 Credit)

Writing Memos, Circulars and Notices: What is a Memo?- Principles of précis writing- Approaches to memo writing- Characteristics of a memo- Guidelines for writing memos- Language and writing style of a memo- Format of a Memo; Circulars- Guidelines for writing a circular- Languages and writing style of a circular- Format of a circular; Notices- Purpose- Format- Important points to remember while writing a notice

Report Writing: Features of Writing a Good Report; Purpose of Report Writing; Difference between Business Report and Engineering Report-Characteristics of writing a good report-Importance of communication in report writing; Guidelines for Report Writing; Steps in Report Writing; Structure of Report; Types of Reports and Different Formats

Writing E-mail: Principles of E-mail; E-mail Etiquette; Overcoming Problems in E-mail Communication.

Oral Communication Skills: Oral Business Presentation- Purpose –Audience-Locale; Steps in Making a Presentation- Research and planning-Structure and style-Preparation –Presentation; Delivering a Presentation.

Unit IV

(1 Credit)

Meetings: Types of Meetings; Importance of Business Meetings; Different Types of Business Meetings; Conducting Meetings-Selecting participants-Developing agendas-Opening meetings-Establishing ground rules for meetings-Time management-Evaluation of meeting process- Evaluating the overall meeting-Closing meetings; Common Mistakes Made at Meetings.

Unit V**(1 Credit)**

Reading Skills: Reading Skill; Purpose of Reading; Types of Reading; Techniques for Effective Reading.

Employment Communication – Resume: Contents of Good Resume; Guidelines for Writing Resume; Different Types of Resumes; Reason for a Cover Letter to Apply for a Job-Format of Cover Letter; Different Types of Cover Letters.

Unit VI**(1 Credit)**

Employment Communication – Job Interview: Importance and Factors Involving Job Interview; Characteristics of Job Interview; Job Interview Process; Job Interview Techniques- Manners and etiquettes to be maintained during an interview; Sample Questions Commonly asked During Interview Communication.

GEC-3.2: PRINCIPLES OF DIGITAL ELECTRONICS**4 Hrs/Week****Credits: 4****Total: 60 Hours****UNIT-I****(1 Credit)**

Logic family- Characteristics of digital ICs, CMOS logic family, Comparison with TTL,

Logic Gates and Boolean algebra: Positive and Negative logic, Truth Tables of OR, AND, NOT, NOR, NAND, XOR and XNOR gates, Universal Gates, implementation of basic gates by using universal gates. Basic postulates and fundamental theorems of Boolean algebra, Boolean laws and theorems, DeMorgan's theorems, Boolean expression and implementation.

UNIT-II**(1 Credit)**

Simplification of logic expressions using Boolean laws and theorems, SOP and POS Expressions, K-map-Simplification (3 and 4 variable expressions), Don't care conditions, implementation of simplified expressions using NAND gates.

Arithmetic Circuits: Binary addition and subtraction, Half and Full Adder, Half and Full Subtractor,

(Logic circuit using XOR, Basic gates and NAND gate), 4-bit binary Adder/subtractor,

Data processing circuits: Multiplexers (4:1, 8:1, 16:1), De-multiplexers (1:4, 1:8, 1:16), Decoders (BCD to decimal, 7-segment driver), Encoders (decimal to BCD, priority encoder) (Mention corresponding ICs)

UNIT-III**(1 Credit)**

Sequential Circuits: SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop. Master-slave JK Flip-Flop. Applications

Shift registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4-bits), Applications of shift registers

Counters (4-bits): Asynchronous counters, Decade Counter, Ring Counter, Synchronous Counter, Applications of counters

UNIT-IV**(1 Credit)**

Op-amp and applications- Introduction, virtual ground, Inverting and non-inverting amplifier(derivation), Adder, Subtractor, Integrator, Differentiator, Comparator

Clock and Timer (IC 555): Introduction, Block diagram of IC-555, Astable and Mono stable multivibrator circuits, Voltage Controlled Oscillator, FSK, PWM.

D-A and A-D Conversion: 4 bit binary weighted and R-2R D-A converters, circuit and working, characteristics, A-D conversion-characteristics, Simultaneous ADC, successive approximation ADC. (Mention of relevant ICs for all).

Reference Books:

1. OP-Amps and Linear Integrated Circuit, R. A. Gaya wad, 4th edition, 2000, Prentice Hall
2. Digital Principles and Applications, A.P. Malvino, D.P.Leach and Saha, 7th Ed., 2011, Tata McGraw
3. Modern digital Electronics, R P Jain, Tata McGraw-Hill Publishing Company Limited, 3rd Edition
4. Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
5. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
6. Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001, PHI Learning.
7. Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia (1994)

8. R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)

PRACTICALS

(Credits: 2)

1. Implementation of Boolean expressions using basic gates-simplification using K-map and implementation of simplified expressions
2. Half Adder and Full Adder.[using different IC's]
3. Half Subtractor and Full Subtractor.[using different IC's]
4. 4 bit binary adder and adder/subtractor using Full adder IC.
5. To design a seven segment decoder.
6. To build Flip-Flop (RS, Clocked RS, D-type and JK) circuits using NAND gates.
7. To build JK Master-slave flip-flop using Flip-Flop ICs
8. To build a Counter using D-type/JK Flip-Flop ICs
9. To make a Shift Register (serial-in and serial-out) using D-type/JK Flip-Flop ICs
10. To design a Monostable and Astable Multivibrator using IC 555 Timer.
11. Digital to Analog Converter
12. Analog to Digital Converter
13. Multiplexer and Demultiplexer
14. Universal gates-NAND and NOR gates

Note: Minimum 08 experiments to be conducted

SDC-3.3: Hardware Concepts -II

4 Hrs/Week

Total Credits: 04

UNIT – 1

(1 Credit)

Microprocessor History - The First Microprocessor, PC Processor Evolution, 16-Bit to 64-Bit Architecture Evolution Processor Specifications- Data I/O Bus, Address Bus, Internal Registers (Internal Data Bus), Processor Modes, Processor Benchmarks, Comparing Processor Performance, Cache Memory

UNIT – 2

(1 Credit)

Processor Features - System Management Mode (SMM), Superscalar Execution, MMX Technology, Dynamic Execution, Dual Independent Bus Architecture, HT Technology, Multicore Technology Processor Manufacturing- Processor Re-Marking, PGA Chip Packaging, Single Edge Contact and Single Edge, Processor Packaging, Processor Socket and Slot Types

UNIT – 3**(1 Credit)**

CPU Operating Voltages Math Coprocessors (Floating-Point Units) Processor Bugs and Stepping, Processor Code Names -P1 (086) Processors, P2 (286) Processors, P3 (386) Processors, P4 (486) Processors, P5 (586) Processors, AMD-K5, Intel P6 (686) Processors, Pentium Pro Processors, Pentium II Processors, Pentium III, Celeron, Intel Pentium 4 Processors, Pentium 4 Extreme Edition Intel Core Processors, Intel Core 2 Family, Intel (Nehalem) Core iProcessors, AMD K6 Processors, NexGen Nx586 AMD-K6 Series - AMD K7 Processors, AMD Athlon AMD Duron AMD Athlon XP Athlon MP AMD K8 Processors AMD Athlon 64 and 64 FX AMD Sempron AMD Athlon X2, 64 X2, and 64 FX AMD K10 Processors (Phenom, Phenom II, Athlon II, Athlon X2, Sempron) AMD Fusion Processors Processor Upgrades.

UNIT – 4**(1 Credit)**

1. Over clocking, Quartz Crystals, Modern PC Clocks, Unlocking Cores, Bus Speeds and Multipliers, Processor Cooling, Heat sinks, Liquid Cooling, Thermally Advantaged Chassis, Processor, Troubleshooting Techniques

Practicals Lab**2 credits**

1. Write an assembly level program for Computing Physical Address using 8086 processor technology
2. Write an assembly level program Sum of 'n' consecutive numbers
3. Write an assembly level program to Separate Odd and Even numbers
4. Write an assembly level program to addition/subtraction of N nos.
5. Write an assembly level program to Finding largest and smallest of 5 nos.
6. Computing GPR using 8086 processor technology

7. Arithmetic and logic computing using 8086 processor technology
 - Add, Subtract, Multiply, Division
8. Printing strings using 8086 processor technology.
9. BIOS Reading – Amibios, Net Rock, Phoenix.
10. Installing Processor and heat sink .
- 11.. Trouble shooting VPROM errors.
12. Manual handling of processors to know the heat.

SDC 3.4: Computer Networking I Through Java Programming

4 Hrs/Week

Total Credits: 04

Unit I

(1 Credit)

Review of basic concepts: Network architecture, protocol hierarchies, network LAN technologies: Ethernet, Fast ethernet, Giga ethernet, virtualLAN. WAN technology: Point-to-point WAN's , switched WAN's : X.25, frame relay, ATM. Types of cabling : coaxial, UTP, STP, FOC. Types of connectors: RJ-45, T-connector, BNC. Terminator.

Digital transmission: Digital-to-Digital conversion: line coding, unipolar encoding. Polar encoding , bipolar encoding . Analog-to-Digital conversion , analog transmission, Digital-to-Analog conversion, Analog-to-Analog conversion.

UNIT II:

(1 Credit)

Data link layer: Introduction, functionality of data-link layer, services provided to network layer. Framing: frame and packet. Types of errors: single bit error and burst error. Error detection: Types of error detection codes, error correction, Data link control: flow control, stop and wait, error control. Data link protocols: HDLC, PPP, LCP and NCP.

UNIT III:

(1 Credit)

Network layer: Introduction, layer-3 features. Services provided to the transport layer. Network addressing: IPv4and IPv6. Network routing : Unicast routing, broadcast routing, multicast routing, anycast routing and geocast routing .

Multicast routing protocols, routing algorithms. Internetworking, tunneling and Packet Fragmentation. Routing protocols: OSPF, ISIS, BGP.

UNIT IV:

(1 Credit)

Introduction to Java: Java Development Kit (JDK); byte code, JVM; Object-oriented programming; data types and tokens: operators: arithmetic operators, bitwise operators, relational operators, assignment operator, ternary operator. Control statements, arrays & strings. class and objects: data abstraction, polymorphism, inheritance, interface, packages: api packages: lang, util, net.

Exceptions: Fundamentals of exception, built-in exception, exception types,

Threads: Multithreading in Java, creating threads, thread synchronization.

Java IO: output streams, input streams

Reference: 1. Networking Complete BPB Publication, 7th edition

2. Computer Networking 5th edition Andrew S. Tanenbaum By PHI

3. Peterson Davie - Computer Networks: A Systems approach, Morgan
Kauffman -Harcourt Asia, 2nd Edn

4. D. Norton and H. Schildt - Java2: The complete reference - TMH 2000

5. Core java for beginners Rashmi kantha das , 3rd edition.

6. Object Oriented Programming with Java, M.T. Somashekara etal., PHI ,
New Delhi 2016.

Lab Programs:

(2 Credits)

1. Java program related to Http URL Connection.
2. Java program related to URL Demo.
3. Java program related to URL Connection.
4. Java program related to InetAddress.
5. Java program related to Socket
6. Java program related to TCP Date Client and Server
7. Java program related to TCP Client and Server Communication.
8. Java program related to Ping Server.
9. Java program related to Datagram Packet.
10. Initializing and Reloading Router.

11. Initializing and Reloading Switch.
12. Initializing and Reloading Router and Switch.
13. Configuring Basic Switch Settings.
14. Configuring Switch Security Features.
15. Configuring Basic Router Setting with IOS CLI.

SDC:3.5: MICROPROCESSOR 8085 AND ITS APPLICATIONS

4 Hrs/week

Credits: 4

Total : 60 Hours

UNIT- I

Introduction to Microprocessor

Block diagram of a computer-Function of each block, Hardware, Software, Firmware, Classification of computers, Microprocessor- Evolution of microprocessor, programming languages-Advantages, disadvantages, object code generation, Basic block diagram of microprocessor based system- word, memory capacity, classification

UNIT- II

Microprocessor 8085

Features of 8085, Pin diagram of 8085, classification of signals, Need for de-multiplexing, Architecture of 8085-Functional block diagram- ALU, Flags, General purpose registers, register pairs, PC and SP-function, Timing and control unit, instruction register and decoder, temporary registers (W and Z).

Generation of control signals, clock and reset circuits, Bus drivers- related ICs (mention only)

Timing diagrams- Instruction cycle, machine cycle, T-states, Timing diagram for Op-code fetch, Memory read and write, I/O read and write

Instruction format- One byte, two byte and three byte- Examples for each

Instruction set, instruction classification- Data transfer, Arithmetic, Logical, Branching and machine control instruction- Explanation of all instructions, **Addressing modes**- Examples, **Interrupts**- Importance of interrupt signals, types, supporting instructions.

UNIT- III**Programming μ p-8085**

Programs using data transfer instructions (Direct and indirect addressing)- loading and copying the data, Exchanging the contents in block of memory.

Programs for Addition and subtraction of 8-bit and 16-bit numbers

Addition of two 8-bit and two 16-bit numbers- ignoring and considering the possible overflow

Subtraction of two 8-bit and two 16-bit numbers

Addition and subtraction of two 8-bit BCD numbers

Multiplication- Program to multiply two 8-bit numbers, Square of an 8-bit number

Searching for Largest/Smallest number- Program to find the largest/smallest number in a given array of numbers and display the same in data field

Sorting numbers- Program to arrange numbers in ascending/descending order using bubble sort method

Number of 1's and 0's- Program to find the number of 1's and 0's in a given byte

Testing for zero condition of a result, Verifying the given number- Even or Odd

1's and 2's complement- program to obtain 1's and 2's complement of a 8-bit number

Verification of truth tables of logic gates- AND, OR, NOT, NAND, NOR, XOR and XNOR gates

Counters and delays- calculation, **Stack** and **Subroutine**- programming examples

Program to display- Count from 00-FF, 00- 99 (decimal count), Down counter,

UNIT- IV**Interfacing I/O devices and Applications**

Interfacing concepts- Peripheral I/O or Memory mapped I/O, **Memory Interfacing**- Address decoding- its importance, NAND gate decoder/decoder IC, Memory map, Interfacing ROM and RAM- Simple block diagram, finding memory address

Interfacing I/O devices- I/O instructions, Interfacing 7-segment display, Input devices

Data transfer schemes- Format of data transfer, modes, microprocessor and peripheral controlled data transfer

Compatible ICs of μ P-8085(mention only)- 8255 (PPI), 8253 (Timer/counter), 8279 (Keyboard/display interface), 8251 (Serial communication interface), 8259 (Priority interrupt controller), 8257 (DMA Controller)

Programmable peripheral interface(8255)- features of PPI (8255)- Introduction, Pin diagram of 8255, Functional block diagram of 8255, **Various modes**- Mode-0, Mode-1, Mode-2, BSR mode, Generation of control word, status signals used.

Interfacing- 7-segment display unit, Keyboard, DAC, Stepper motor, traffic light controller,

REFERENCES

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S.Goankar, Prentice Hall.
2. Fundamentals of Microprocessors and Microcontrollers (Seventh Revised Edition):B.Ram – DhanpatRai Publications (P) Ltd.

PRACTICALS

(Credits : 2)

1. Program to add and subtract two 8-bit numbers-considering possible overflow
2. Program to add two 16-bit numbers-considering possible overflow
3. Program to subtract two 16-bit numbers-considering possible overflow
4. Program to Exchange the contents of two blocks of memory
5. Program to add and subtract two 8-bit BCD numbers
6. Program to multiply two 8-bit numbers
7. Program to find the largest/smallest number in a given array of numbers and display the same in data field
8. Program to search for a number in a given array of numbers and display the same in data field
9. Program to arrange numbers in ascending order using bubble sort method
10. Program to arrange numbers in descending order using bubble sort method
11. Program to find the number of 1's and 0's in a given byte
12. Program to verify the truth tables of logic gates
13. Program to display the count from 00-FF(or FF-00) in data field
14. Program to display the count from 00-99 (or 99-00) in data field
15. Program to realize digital clock

DEMO PROGRAMS- Interfacing

1. Interfacing- 7-segment display unit
2. Interfacing- Keyboard
3. Interfacing- DAC
4. Interfacing- Stepper motor
5. Interfacing-Traffic light controller

Note: Minimum 08 programs to be executed.

GEC-4.1: BASIC ICT SKILLS

4 Hrs/Week

Total Credits: 04

Unit 1

(2 credits)

Basic Knowledge of Computers

Understand basic computer hardware components and terminology. Understand the concepts and basic functions of a common computer operating system, Start up, log on, and shut down a computer system properly, Use a mouse pointing device and keyboard, Use Help and know how to troubleshoot routine problems, Identify and use icons (folders, files, applications, and shortcuts/aliases), Minimize, maximize and move windows, Identify common types of file extensions (e.g. doc, pdf, html, jpg, gif, xls, ppt, rtf, txt, exe), Check how much space is left on a drive or other storage device, Back up files, Download and install software on a hard disk, Understand and manage the file structure of a computer, Check for and install operating system updates

Unit 2

(2 credits)

Proficiency in Using Productivity Software

- Create documents of various types and save in a desired location, Retrieve an existing document from the saved location, Select, copy, and paste text in a document or desired location, Print a document, Name, rename, copy and

delete files, Understand and know how to use the following types of software programs:, Word processing (example: MS Word, Google Doc, Writer), Presentation (example: PowerPoint, Impress), Spreadsheet (example: Excel, Calc), PDF reader (example: Acrobat Reader, Preview), Compression software (example: WinZip, Stuffit, 7-Zip)

Electronic Communication Skills

- Email, using a common email program (example: MS Outlook, Gmail, Apple Mail), Compose, Send, Reply, Forward messages, Add attachments to a message, Retrieve attachments from an email message, Copy, paste and print message content, Organize email folders, Understand what an electronic discussion list is and how to sign up and leave one (example: Listserv, Listproc)

Unit 3

(2 credits)

Internet Skills

- Set up an Internet connection and connect to the Internet, Have a working knowledge of the World Wide Web and its functions, including basic site navigation, searching, and installing and upgrading a Web browser. Use a browser effectively, including bookmarks, history, toolbar, forward and back buttons, Use search engines and directories to find information on the Web, Download files and images from a Web page, Understand and effectively navigate the hyperlink structure of the Web, Understand how keep your information safe while using the Internet

Moving Files

Understand the purpose of Secure File Transfer Protocol (SFTP) and Secure Copy Protocol (SCP), Log in and connect to a distant server using Secure Shell client (SSH), Transfer files by uploading or downloading, View and change folder/document security settings, Copy files from hard disk to storage devices and vice versa.

Industrial Training:**4hours/week****2 Credits**

Students has to attend the industrial training programme in different companies collaborated and submit a report on training programme .

Report will be submitted at the time of examination.

GEC 4.2: Programming using PYTHON**UNIT I:Introduction to Python****(1 Credit)**

Python Introduction, History of Python, Python features, Python Installation, Python Environment Variables, Running Python, Simple Programs, Python Identifiers, Reserved words, Lines and Indentation, Multi line statements, Quotation in Python, Comments in Python, Command line arguments, Assigning values to the variables, Multiple assignment, Standard data types, Type Conversion, Operators in Python,Precedence of operators.

Sequence Control

Conditional Statements: if, if-else, nested if –else Looping: for, while, nested loops. Control statements: Terminating loops, skipping specific conditions.Mathematical functions- Random number function, Trigonometric functions, Mathematical Constants,

UNIT II : Strings & Lists:**(1 Credit)**

Assigning values in strings, String manipulations, String special operators, String formatting operators, Triple Quotes, Raw String, Unicode String, Build-in-String methods, Lists- Introduction, Accessing values in list, List manipulations, List Operations, Indexing, slicing & matrices. Functions & Methods Built–in Functions and methods, Tuples- introduction, Accessing values, Tuple functions,

Dictionaries

Concept of dictionary, techniques to create, update& delete dictionary items. Functions: Defining a function, calling a function, Advantages of functions, types of functions, function parameters, Formal parameters, Actual parameters, anonymous functions, global and local

variables Modules: Importing module, Creating & exploring modules, Math module, Random module, Time module,

OOPs Terminology

(1 Credit)

OOPs Concepts –User defined-types, Attributes, Instance, Instance variable, Instances as return value, Objects, Objects are mutable, Copying, Debugging, Classes and Functions, Function Overloading, Classes and Methods, object-oriented features, the init method, operator overloading, Type-based dispatch, Polymorphism, Interface and implementation, inheritance, class diagram, Data encapsulation

Python Scripts

User defined functions, Pass by value & pass by reference, function arguments & its types Import statements, Locating modules, Namespace, dir(), global(), local(), reload(), Packages in python, I/O function. Graphics- Introduction, sample graphics program, Graphics.py vs Driven graphic, Animation. Matplotlib, Bar chart, Polar plot, pie charts, histograms, contour plot.

Text books:

1. PovelSolin, Martin Novak ,Introduction to Python Programming, 2012
2. Jacob Fredslund ,Introduction to Python Programming, 2007
3. Hands-On Python: A Tutorial Introduction for Beginners, Andrew N. Harrington
<http://anh.cs.luc.edu/python/hands-on/handsonHtml/handson.html>
4. Python scientific lecture notes, EuroScipytutorial team, 2010 <https://scipy-lectures.github.io/>

References:

1. John C. Lusth , An Introduction to Python, 2011
2. DaveKuhlman, Introduction to Python, 2008

Programming with PYTHON Lab

2Credits

1. Write python program to check the given number is prime or not

2. Write python program to display the first n terms of Fibonacci series.
3. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon users choice
4. Write python program to find sum of natural number using recursion
5. Write python program to find factorial of the given number
6. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input paramters from user.
7. Write python program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria : Grade A: Percentage ≥ 80 Grade B: Percentage ≥ 70 and ≤ 60 and ≤ 40 and
8. Write python program to find sum of the following series for n terms: $1 - \frac{2}{2!} + \frac{3}{3!} - \dots - \frac{n}{n!}$
9. Write python program to calculate the sum and product of two compatible matrices
10. With the help of string array or list, display a simple calendar in python program without using the calendar module
11. Write a menu-driven program to create mathematical 3D objects I. curve II. sphere III. cone IV. arrow V. ring VI. cylinder.
12. Write and test a function a. removeDuplicates(somelist) that removes duplicate values from a list b. innerProd(x,y) that computes the inner product of two (same length) lists.
13. Design a user interface in python to function a simple calculator
14. Show the functionalities of the Boolean operators and Boolean functions in performing a choice of colors via mouse clicks in Rectangles.
15. Demonstrate the different types of plots with necessary features using Matplotlib: Bar chart, Polar plot, pie charts, histograms, contour plot

SDC-4.3:Hardware Concepts -III

4 Hrs/Week

Total Credits: 04

Power Supplies and Firewall

UNIT I

(I Credit)

The Power Supply

Primary Function and Operation - Voltage Rails - The Power Good Signal ,**Power Supply Form Factors** - Modern Form Factors ,**Power Switches** - ATX and Newer, PC/XT/AT and LPX Power Switches ,**Motherboard Power Connectors** - AT/LPX Power Supply Connectors, ATX and ATX12V Motherboard Power Connectors, Backward and Forward Compatibility, Dell Proprietary onstandard) ATX Design,**Additional Power Connectors** - Peripheral Power Connectors, Floppy Power, connectors, Serial ATA Power Connectors, PCI Express Auxiliary Graphics Power Connectors

UNIT II

(I

Credit)Power Supply Specifications - Power Supply Loading, Power Supply Ratings, Other Power Supply Specifications, Power Factor Correction, SLI-Ready and CrossfireX,Certifications, Safety Certifications.**Power-Use Calculations** - Power Savings, 80 Plus, ENERGY STAR, Advanced Power Management, Advanced Configuration and Power Interface

UNIT III

(I Credit)

Power Cycling

Power Supply Troubleshooting - Overloaded Power Supplies, Inadequate Cooling, Using Digital Multimeters, Specialized Test Equipment, **Power Supply Recommendations** - Modular Cables, Sources for Replacement Power Supplies

Power-Protection Systems - Surge Suppressors (Protectors), Network and Phone Line Surge Protectors, Line Conditioners, Backup Power **Real-Time Clock/Nonvolatile RAM (CMOSRAM)** Batteries - Modern CMOS Batteries Obsolete or Unique CMOS Batteries, CMOS Battery Troubleshooting

UNIT IV**(I Credit)****Fire Wall as a Device**

Introduction and definition, use of firewall as device, firewall hardware and softwares, working of firewall, using firewall software, firewall industry approach Firewall Types – Proxy, UTM, stateful inspection, threat focus.

LAB Exercises

1. Identify and Installing AT and ATX Power Supply Units or Devices.
2. Assemble and disassemble inside the power supply Unit.
3. Basic Trouble shooting Hints of power supply units
4. Power over IC(POI) installing and learning its features
5. Power over Ethernet(POE) installing and learning its features
6. Introduction of Firewall devices
7. Inbound and outbound Rules in Firewall Device.
8. Policy control and Services of Firewall as a Device.
9. Introduction of Firewall using Proxy Server.
10. Inbound and outbound Rules in Proxy server.
11. Policy control and Services of Proxy server.

SDC 4.4: Computer Networking II through Java Programming**4 Hrs/Week****Total Credits: 04****UNIT -I. The Transport Layer****(1 Credit)**

Services provided to the upper layer. Process to Process Delivery- Client Server Paradigm, Multiplexing: upward and downward multiplexing, Demultiplexing. Connectionless transport: UDP, Connection oriented service: TCP. Connectionless v/s Connection oriented service. Reliable VS Unreliable. TCP-UDP Datagram Format, MAC address, internet transport protocols: TCP and UDP, ARP, DHCP, ICMP

UNIT – II. The Application Layer**(1 Credit)**

Domain Name System, domain name space, FTP, Telnet, E-mail, message

transfer: SMTP, comparison of POP3 and IMAP, World Wide Web: static web document-HTML,dynamic web document-HTTP. Remote procedure call (CRP).

UNIT – III Cryptography

(1 Credit)

Introduction to cryptography, Terminology and background techniques, types of ciphers: substitution ciphers, transposition ciphers encryption algorithms, data encryption and decryption-standards, public keys encryption , Symmetric and Asymmetric Key Cryptography, Steganography, digital signatures: symmetric key signature and public key signature.

UNIT-IV. Network security:

(1 Credit)

Network security, security services, security threats in network, cyber crime and hackers. Virtual private network, PKI, SHTTP, SSL, IPsec. Wireless Security, Firewalls, Intrusion detection system, secured email, Security in GSM.

Reference:

1. Charlie Kaufman, Radia Perlman, Mike Speciner, “Network Security, Private communication in public world”, PHI Second Edition, 2002.
2. Douglas R Simson “Cryptography – Theory and practice”, CRC Press, First Edition, 1995.
3. AtulKahate – Cryptography and Network Security , 2nd Edition Tata McGraw Hill Publication, New Delhi-2006
4. Behrouz A. Forouzan and D. Mukhopadhyay- Cryptography & Network Security, 2nd Edition - 1st reprint 2010, McGraw Hill, New Delhi.
5. Computer Networking 5th edition Andrew S. Tanenbaum By PHI

Lab Programs:

(2 Credits)

1. Troubleshooting IPV4 and Static Routing.
2. Configuration OSPF VS on Routers.
3. Router start up Configuration List.
4. Configuration FTP Server and Client.
5. Intranet NFS Lab.
6. Configuration of DHCP basics on Switch.
7. Dynamic and Static NAT.

8. Configuring IPV6 for Switches.
9. Configuring Vlan and Trunking.
10. Troubleshooting Vlan Configuration.
11. Mapping the Internet.
12. Implementing Vlan Security.
13. Configuring Per-Interface Inter Vlan Routing.
14. Troubleshooting Inter-Vlan Routing.
15. Configuring IPV4 Static and Default Routes.

SDC-4.5: 8051 MICROCONTROLLER AND ITS INTERFACING

4 Hrs/week

Credits : 4

Total : 60 Hours

Unit-I: Introduction to microcontrollers

1 credit

Introduction, Microprocessors and Microcontrollers, Basic building block of Microcontroller, Comparison of Microprocessors and Microcontrollers, Types of Microcontroller

8051 Architecture: Introduction (Salient features of 8051), Architecture of 8051(basic block diagram of 8051), Pin description- functions of various pins of 8051, Basic Oscillator circuit and Timing, Program Counter and Data Pointer, A, B and CPU register, Flags & PSW, SFRs (Special Function Registers) - bit addressable SFRs and byte addressable SFRs in 8051, brief description of each SFR.

Memory Organization – data and program memory. Structure of internal data (RAM) memory- description of register banks, bit addressable RAM area and general purpose RAM in 8051. Brief description of external data memory and associated signals, block diagram representation. Program memory structure – internal program memory, block diagram representation, address range and associated signals. External program memory, block diagram representation, address range and associated signals. Block schematic of interfacing of external program memory. Stack and Stack Pointer.

Unit-II: Instruction Set and Assembly Language Programming

1 credit

Addressing Modes: Introduction, Immediate, Register, Direct, Register Indirect, indexed and implied addressing modes, definition and example for each addressing mode.

Instruction set: Data transfer instructions, Arithmetic instructions, Logical instructions, Branch instructions, Subroutine instructions, Bit manipulation instruction, brief description of each instruction with examples.

Assembly language program examples: Data transfer operations with internal and external memory, 8 and 16 bit arithmetic operations; addition, subtraction, multiplication and division. Logical operations, truth table verification, sorting of numbers in an array, finding the largest and smallest number in an array. *8051 programming using 'C'.*

Unit-III:8051Interrupts,Timers/counters and Serial Communication 1 credit

Interrupts- Basics of interrupts, 8051 interrupt structure and their vectors (ISR address), Timer Flag interrupts, Serial port interrupts, External interrupts, Reset, Interrupt control, Initializing interrupts (enable/disable), Interrupt priorities, Interrupt Destinations and Software generated Interrupts.**Timers and Counters-** Qualitative description of timer/counters

Serial Communication - Data communication, Basics of Serial Data Communication, 8051 Serial Communication – Serial data transmission modes i.e Mode 0 (Shift register mode), Mode 1 (Baud Rate), Serial data mode 3 and Connections to RS-232.

Unit-IV: Interfacing and Applications

Introduction to interfacing -General structure of I/O Ports in 8051, Internal structures of Port0, Port1, Port2 and Port3, schematic representation, brief description of each.

8255A Programmable Peripheral Interface- Architecture of 8255A, I/O addressing, Interfacing I/O devices with 8051 using 8255A. **Interfacing Examples-** Interfacing LED to 8051, circuit diagram, assembly language program to flash LED with a suitable time delay, Interfacing Keyboard, Interfacing 7-segment display unit- Assembly language program to display numbers. Interfacing DAC and ADC, Interfacing Stepper motor

Reference Books:

1. “The 8051 Microcontroller Architecture, Programming & Applications”, Kenneth J. Ayala

2. “Microcontrollers: Architecture, Programming, Interfacing and System Design”, Raj Kamal,
3. “The 8051 Microcontroller and Embedded Systems – using assembly and C”-, Muhammad Ali Mazidi and Janice Gillespie Mazidi and Rollin D.
4. “The 8051 Microcontroller”, V.Udayashankar and MalikarjunaSwamy,

PRACTICALS

(2 Credits)

SDC 4.5: 8051 MICROCONTROLLER AND ITS INTERFACING

At least 08 experiments to be conducted

1. ALP to add, subtract, multiply and divide two 8-bit numbers
2. ALP to transfer a block of data from one location to another location
3. ALP to exchange two blocks of data stored in memory.
4. ALP to add/subtract two 16-bit numbers
5. ALP to add two BCD numbers
6. ALP to count the number of 1's in a given data byte.
7. ALP to multiply a 16 bit number by an 8 bit number
8. ALP to find the average of 10 numbers
9. ALP to find the square/cube of a given number
10. ALP to arrange a set of data in ascending/descending order
11. Program to find the GCF of two numbers
12. Program to generate Fibonacci series.
13. Program to find LCM of two numbers
14. Program to search an element in an array of N numbers
15. ALP to find the largest/smallest of N numbers.
16. ALP to implement BCD counter to count from 0 to 9 / 9 to 0
17. ALP to implement BCD counter to count from 99 to 00/ 00 to 99
18. ALP to convert a hexadecimal number to ASCII number
19. ALP to convert hexadecimal number to a decimal number
20. ALP to convert an ASCII number to hexadecimal number

21. ALP to generate a delay

Interfacing programs

22. Program to generate Square, Triangular, Ramp, Sine wave using DAC interface to 8051

23. Program to rotate Stepper motor in clockwise/anticlockwise direction

24. Program to interface keyboard

25. Program to display a string (numbers) on seven segment display interface

26. Interfacing traffic light controller

27. Interfacing LCD

Fifth Semester-V Sem

GEC-5.1: BUSINESS PROCESS OUTSOURCING (BPO) SKILLS

4 Hrs/week

Credits : 4

Unit I

(1 Credit)

Business Process Outsourcing – Basics – Benefits of BPO – Growth Drivers – BPO Models and Types of Vendors – Off shore BPO – Evolution Destinations – Challenges of Off shoring – BPO Companies in India.

Unit II

(1 Credit)

BPO Industry – Employment Opportunities – Employee Structure – Skill Set Required – Compensation Levels – Contact Centre BPO – Types of Call Centres – Technology – Components and working of a Call center – Issues and Problems – Case Study – Intelenet Global.

Unit III

(1 Credit)

Healthcare BPO – Structure of the American Healthcare Sector – Activity Profile – Future Trends and Threats – Case Study – C bay Systems.

Unit IV

(2 Credit)

Transaction Processing BPO - Elements of Back – Office Services – Financial Services – Insurance – Case Studies – Datamatics – Hinjuja TMT. Human Resource BPO – Reasons for outsourcing HR – Activities involved in HR BPO – HR Outsourcing Trends – Career in HR BPO – Emerging BPO Domains – Media and Entertainment BPO – Publishing BPO.

Text Book:

Business Process Outsourcing Sarika Kulkarni Jaico Publishing House, Delhi 2005

Reference Book:

BPO DIGEST Deepak Shikapur Ameya (Inspiring Books) 2004

Study Tour

Students will be taken to research institute and Industries for vast knowledge about the Hardware and Networking Concepts.

GEC-5.2:

4 Hrs/week

Credits : 4

Unit I

(1 Credit)

Elements of Monitoring and Tuning , Performance tuning ,Calculating unit conversions, Monitoring , Monitoring vs. Profiling ,Whole-system view ,Sample application model, Sample hardware model ,Before tuning the kernel ,Kernel tunables , Using system documentation ,Recovering from problems , Simple Network Monitoring ,SNMP ,SNMP versions ,Management Information Base ,The MIB hierarchy, Referring to MIB objects Reading a MIB file , Installing SNMP packages , Finding MIB objects ,Using SNMP v1 for queries ,Using SNMP v3 for queries ,Configuring the SNMP client RHCA e Syllabus .

Unit II

(1 Credit)

Enabling the SNMP agent ,Profiling SNMP host access controls , Configuring SNMP v1 access ,Configuring SNMP v3 access ,Beyond RH442: Extending snmpd .Graphical Reporting , MRTG, Configuring MRTG , Allowing access to MRTG , Creating a dashboard in MRTG , Ad-hoc utilities, Installing iostat and sar , Using iostat and reconfiguring sar , Awk ,Using awk , Gnuplot , Using Gnuplot , Creating a custom script .

Scheduling a custom script , Kernel-Level Profiling , OProfile · Installing OProfile ,
 Installing kernel-debuginfo , Setting up OProfile , Running a test, Reviewing results
 ,OProfile architecture , SystemTap , Required packages , SystemTap scripts , The stap
 command.

Unit III **(1 Credit)**

Queuing Theory , Introduction to queuing theory , Little's Law , Queue length , Queue
 length vs wait time , · Wait time , Finding hot spots in code , Completion rate , Arrival
 rate vs completion rate , Finding a valid observation period , · Predicting system-wide
 limits , · Predicting resource limits , · Summary of strategies , Compensating for Physical
 Disk Characteristics , Physical factors affect disk IO , Disk storage density , Choosing a
 peripheral interconnect , SCSI bus considerations , Electro-mechanical positioning ·
 Block IO requests and cache effect , Tuning sequential read access, Tuning the disk
 queue ,

Unit IV **(1 Credit)**

Tuning the deadline scheduler , Tuning the anticipatory scheduler , Tuning the noop
 scheduler , Tuning the (default) cfq scheduler , Fine-tuning the cfq scheduler , Physical
 block device interfaces · Virtual block devices ,Tuning virtual block devices, Logical
 volumes and VBDs ,Implementing snapshot storage ,Reducing Disk Visit Count ,The
 virtual file system (VFS), · Layout of ext2/ext3 , Fragmentation , · Viewing fragmentation .

Tuning fragmentation RHCA Course Syllabus ipsr solutions ltd, · Filesystem limits.

Lab Practical's **(2 Credits)**

1. Overview of system components and architecture as they relate to system performance.
2. Translating manufacturers' hardware specifications into useful information.
3. Using standard monitoring tools effectively to gather and analyze trend information.
4. Gathering performance-related data with SNMP.

5. Using open source benchmarking utilities.
6. Network performance tuning.
7. Application performance tuning considerations.
8. Tuning for specific configurations.

SDC-5.3 INSTALLING AND CONFIGURING WINDOWS SERVER

2012

4 Hrs/week

Credits : 4

Unit I

(1 Credit)

Install and configure servers

Install servers

Plan for a server installation; plan for server roles; plan for a server upgrade; install Server Core; optimize resource utilization by using Features on Demand; migrate roles from previous versions of Windows Server.

Configure servers

Configure Server Core; delegate administration; add and remove features in offline images; deploy roles on remote servers; convert Server Core to/from full GUI; configure services; configure NIC teaming.

Configure local storage

Design storage spaces; configure basic and dynamic disks; configure MBR and GPT disks; manage volumes; create and mount virtual hard disks (VHDs); configure storage pools and disk pools

Configure server roles and features

Configure file and share access Create and configure shares; configure share permissions; configure offline files; configure NTFS permissions; configure access-based enumeration (ABE); configure Volume Shadow Copy Service (VSS); configure NTFS quotas

Unit II**(1 Credit)****Configure Hyper-V**

Create and configure virtual machine settings Configure dynamic memory; configure smart paging; configure Resource Metering; configure guest integration services. Create and configure virtual machine storage Create VHDs and VHDX; configure differencing drives; modify VHDs; configure pass-through disks; manage snapshots; implement a virtual Fibre Channel adapter. Create and configure virtual networks Implement Hyper-V Network Virtualization; Configure Hyper-V virtual switches; optimize network performance; configure MAC addresses; configure network isolation.

Deploy and configure core network services

Configure IPv4 and IPv6 addressing Configure IP address options; configure subnetting; configure supernetting; configure interoperability between IPv4 and IPv6; configure ISATAP; configure Teredo

.Deploy and configure Dynamic Host Configuration Protocol (DHCP) service Create and configure scopes; configure a DHCP reservation; configure DHCP options; configure client and server for PXE boot; configure DHCP relay agent; authorize DHCP server. Deploy and configure DNS service Configure Active Directory integration of primary zones; configure forwarders; configure Root Hints; manage DNS cache; create A and PTR resource records.

Unit III**(1 Credit)****Install and administer Active Directory**

Install domain controllers .Add or remove a domain controller from a domain; upgrade a domain controller; install Active Directory Domain Services (AD DS) on a Server Core installation; install a domain controller from Install from Media (IFM); resolve DNS SRV record registration issues; configure a global catalog server..Create and manage Active Directory users and computers Automate the creation of Active Directory accounts; create, copy, configure, and delete users and computers; configure templates; perform bulk Active Directory operations;configure user rights; offline domain join; manage inactive and disabled accounts .

Create and manage Active Directory groups and organizational units (OUs)

Configure group nesting; convert groups including security, distribution, universal, domain local, and domain global; manage group membership using Group Policy; enumerate group membership; delegate the creation and management of Active Directory objects; manage default Active Directory containers; create, copy, configure, and delete groups and OUs.

Unit IV

(1 Credit)

Create and manage Group Policy

Create Group Policy objects (GPOs) Configure a Central Store; manage starter GPOs; configure GPO links; configure multiple local group policies; configure security filtering.

Configure security policies Configure User Rights Assignment; configure Security Options settings; configure Security templates; configure Audit Policy; configure Local Users and groups; configure User Account Control (UAC).

Configure application restriction policies Configure rule enforcement; configure AppLocker rules; configure Software Restriction Policies.

Configure Windows Firewall

Configure rules for multiple profiles using Group Policy; configure connection security rules; configure Windows Firewall to allow or deny applications, scopes, ports, and users; configure authenticated firewall exceptions; import and export settings.

Lab Practicals:

1. Installing Windows Server 2012 R2 with the GUI
2. Installing Windows Server 2012 R2 Using Server Core
3. Install and configure servers
4. Installing Microsoft MPIO
5. Promoting a Domain Controller
6. Configuring DNS Integration with Active Directory
7. Creating and Publishing a Shared Work Folder
8. Creating and Publishing a Printer
9. Filtering Group Policy Using Security Groups
10. Configure Hyper-V

11. Deploy and configure core network services
12. Install and administer Active Directory
13. Create and manage Active Directory groups and organizational units (OUs)
14. Create and manage Group Policy
15. Configure security policies
16. Configure Windows Firewall
17. Installing Hyper-V in Full Installation Mode
18. Creating a New Virtual Machine
19. Installing Hyper-V Integration Components

SDC-5.4: Certified Ethical Hacking (CEH)

4 Hrs/week

Credits: 4

UNIT -I

(2 Credits)

Ethical Hacking: Introduction, Networking & Basics, Foot Printing, Google Hacking, Scanning, Windows Hacking, Linux Hacking, Trojans & Backdoors, Virus & Worms, Proxy & Packet filtering, Denial of Service, Sniffer, Social Engineering. Introduction to Computer Systems and Networks , information systems and networks (including wireless networks) and their role in industry business and society. System and Network Vulnerability and Threats to Security , various types of attack and the various types of attackers in the context of the vulnerabilities associated with computer and information systems and networks Physical Security, Steganography,

UNIT -II

(2 Credits)

Cryptography, wireless Hacking, Firewall & Honey pots, IDS & IPS, Vulnerability, Penetration Testing, Session Hijacking, Hacking Web Servers, SQL Injection, Cross Site Scripting, Exploit Writing, Buffer Overflow, reverse Engineering, Email Hacking, Incident Handling & Response, Bluetooth Hacking, Mobile sPhone Hacking An introduction to basic ethical hacking tools and usage of these tools in a professional environment in a form of project ,An introduction to the particular legal, professional and ethical issues ,likely to face the domain of ethical hacking. Ethical responsibilities, professional integrity and making appropriate use of the tools and techniques associated with ethical hacking.

References

1. Gautam Shroff, Enterprise Cloud Computing Technology Architecture Applications
2. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach [ISBN: 0071626948]
3. Dimitris N. Chorafas, Cloud Computing Strategies [ISBN: 1439834539]
- Clack, Martin. Ethical Hacking - Web Based Systems. New York: Cenege, 2009.
4. EC-Council (c2009). (Volume 3) Hacking Web Applications and Data Servers in Certified Ethical Hacking/ Course Technology
5. Fadia, Ankit et al. (c2007). Network Intrusion Alert: An Ethical Hacking Guide to Intrusion Detection/ Thomson Course Technology PTR
6. Gray Hat Hacking : The Ethical Hacker's Handbook /(c2008.). (2nd ed.). New York: McGraw-Hill.

List of Practical's

(2 Credits)

1. Ethical Hacking: Hacking Methodology, Process of Malicious Hacking
2. Foot printing and Reconnaissance;Footprinting.scanning, Scanning Enumeration,
3. Enumeration: Enumeration
4. System Hacking
5. Trojans and Backdoors
6. Viruses and Worms
7. Sniffers
8. Social Engineering
9. Denial of Service
10. Session Hijacking
11. Hacking Web servers
12. Hacking Web Applications
13. SQL Injection
14. Hacking Wireless Networks
15. Hacking Mobile Platforms

20. Evading IDS, Firewalls, and Honey pots

SDC-5.5 Embedded Systems

4 Hrs/week

Credits : 4

UNIT I INTRODUCTION TO EMBEDDED SYSTEMS

(1 credit)

Definition and Classification – Overview of Processors and hardware units in an embedded system – Software embedded into the system – Exemplary Embedded Systems – Embedded Systems on a Chip (SoC) and the use of VLSI designed circuits

UNIT II DEVICES AND BUSES FOR DEVICES NETWORK (1credit)

I/O Devices - Device I/O Types and Examples – Synchronous - Iso-synchronous and Asynchronous Communications from Serial Devices - Examples of Internal Serial-Communication Devices - UART and HDLC - Parallel Port Devices - Sophisticated interfacing features in Devices/Ports- Timer and Counting Devices - '12C', 'USB', 'CAN' and advanced I/O Serial high speed buses- ISA, PCI, PCI-X, cPCI and advanced buses.

UNIT III PROGRAMMING CONCEPTS AND EMBEDDED PROGRAMMING IN C, C++ (1credit)

Programming in assembly language (ALP) vs. High Level Language - C Program Elements, Macros and functions -Use of Pointers - NULL Pointers - Use of Function Calls – Multiple function calls in a Cyclic Order in the Main Function Pointers – Function Queues and Interrupt Service Routines Queues Pointers – Concepts of EMBEDDED PROGRAMMING in C++ - Objected Oriented Programming – Embedded Programming in C++, 'C' Program compilers – Cross compiler – Optimization of memory codes.

UNIT IV REAL TIME OPERATING SYSTEMS – PART - 1 (1credit)

Definitions of process, tasks and threads – Clear cut distinction between functions – ISRs and tasks by their characteristics – Operating System Services- Goals – Structures- Kernel - Process Management – Memory Management – Device Management – File System Organization and Implementation – I/O Subsystems – Interrupt Routines Handling in RTOS, REAL TIME OPERATING SYSTEMS : RTOS Task scheduling models - Handling of task scheduling and latency and deadlines as performance metrics – Co-operative Round Robin Scheduling – Cyclic Scheduling with Time Slicing (Rate Monotonic Co-operative Scheduling) – Preemptive Scheduling Model strategy by a Scheduler – Critical Section Service by a Preemptive Scheduler – Fixed (Static) Real time scheduling of tasks - INTER PROCESS COMMUNICATION AND SYNCHRONISATION – Shared data problem – Use of Semaphore(s) – Priority Inversion Problem and Deadlock Situations – Inter Process Communications using Signals – Semaphore Flag or mutex as Resource key – Message Queues – Mailboxes – Pipes – Virtual (Logical) Sockets – Remote Procedure Calls (RPCs).

TOTAL : 45**TEXTBOOKS**

1. Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill, First reprint Oct. 2003

REFERENCES

1. Steve Heath, Embedded Systems Design, Second Edition-2003, Newnes,
2. David E.Simon, An Embedded Software Primer, Pearson Education Asia, First Indian Reprint 2000.
3. Wayne Wolf, Computers as Components; Principles of Embedded Computing System Design – Harcourt India, Morgan Kaufman Publishers, First Indian Reprint 2001
4. Frank Vahid and Tony Givargis, Embedded Systems Design – A unified Hardware /Software Introduction, John Wiley, 2002.

MINI PROJECT**3 Hrs/Week****Total Credits: 02****Purpose of the project work is :**

(i) To develop abilities of diagnosing problems.

(ii) To develop the abilities to :

(a) Make literature survey.

(b) Design/develop/fabricate/test simple circuits.

(c) Prepare documents for electronic work.

(d) Work as a single.

Topics will be out of two any one

1. HARDWARE PROJECT (HW): The student is expected to work on a project in consultation and acceptance with the instructor on hardware aspects related to industrial environment. The student is also expected to fabricate different cards used in PC, their testing and assembly of PC. The end targets for the project should be well defined and evaluation should place major importance on meeting these targets.

2. NETWORKING PROJECT: The student is expected to work and learn from implementing an application software and study its functional and performance aspects and submit a report. The evaluation must be based on the project report and the seminars.

Scheme of valuation**Demo ---25 Marks****Viva-15****Report-10**

Sixth Sem - 6th sem

GEC-6.1: VLSI Design

4 hours/week**4 credits****UNIT I:****(1 Credits)****Introduction:**

Introduction to IC Technology – MOS, PMOS, NMOS, CMOS & BiCMOS Technologies; Oxidation, Lithography, Diffusion, Ion implantation, Metallization, Encapsulation, Probe testing, Integrated Resistors and Capacitors, CMOS Nanotechnology.

Basic Electrical Properties:

Basic Electrical Properties of MOS and BiCMOS Circuits: I_{ds} - V_{ds} relationships, MOS transistor threshold Voltage, g_m , g_{ds} , Figure of merit ω_0 ; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT II:**(1 credits)****VLSI Circuit Design Processes:**

VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2 μ m CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and MOS Inverters and Gates, Scaling of MOS circuits.

Gate Level Design:

Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Time delays, Driving large capacitive loads, Wiring capacitance, Fan – in, Fan – out, Choice of layers.

UNIT III:**(1 credits)****Data Path Subsystems:**

Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Zero/One Detectors, Counters. Array subsystems: SRAM, DRAM, ROM, Serial Access Memories, Content Addressable Memory.

UNIT IV:**(1 credits)**

Semiconductor integratedCircuit Design:

PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design approach,Parameters influencing low power design.

CMOS Testing:

CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques, System-level Test Techniques, Layout Design for improved Testability.

TEXTBOOKS:

1. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Douglas and A. Pucknell, PHI, 2005 Edition
2. VLSI Desing- K .Lal Kishore, V. S. V. Prabhakar, I.K International, 2009.
3. CMOS VLSI Design – A circuits and systems perspective, Neil H. E Weste, David Harris, Ayan Banerjee, pearson, 2009.

REFERENCE BOOKS:

1. CMOS logic circuit Design - John .P. Uyemura, Springer, 2007.
2. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.
3. VLSI Design – A.Albert Raj, Latha, PHI, 2008
4. Introduction to VLSI – Mead & Convey, BS Publications, 2010.

GEC: 6.2 LINUX Enterprise Clustering and Storage Management

4 Hrs/Week

Total Credits: 06

Unit I

(1 Credit)

Review Red Hat Enterprise Clustering and Storage Management Technologies · Linux Dynamic Device Management · udev Features · udev Rule Configuration · iSCSI · iSCSI as a Shared Storage Device · Configuring an iSCSI initiator · Configuring an iSCSI target ·

Unit II

(1 Credit)

Authentication · Advanced Software RAID · Types and Differences · Monitoring Optimization Techniques · Growth and High Availability · Device Mapper and Multipathing

· Mapping Targets · LVM2 Snapshots · Multipath Device Configuration · Cluster Suite Overview · Design and Elements of Clustering.

Unit III**(1 Credit)**

Cluster Configuration Tools · Clustered Logical Volumes and Lock Management · Quorum and the Cluster Manager · Intracluster Communication · Cluster Tools · Fencing and Failover · Fencing Components · Failover Domains · Quorum Disk · Heuristic Configuration · Service Manager · Resource Groups and Recovery RHCA Course Syllabus ipsr solutions ltd·

Unit IV**(1 Credit)**

Hierarchical Resource Ordering · High Availability Services · Global File System (GFS) Implementation and Configuration · Lock Management · Planning For and Growing On-line GFS · Monitoring Tools · Journal Configuration and Management.

Lab Practicals**(2 Credits)**

1. Install and configure the Red Hat High Availability Add-On.
2. Create and manage highly available services.
3. Work with shared storage (iSCSI) and configure multipathing.
4. Configure GFS2 file systems.
5. Configure XFS® file systems.

SDC-6.3: - LINUX Enterprise Deployment and Systems Management Course

4 Hrs/Week**Total Credits: 04****Unit I****(1 Credit)**

Essential System Management · Goals of Enterprise system management · Standardization, centralization, and scalability · Provisioning and automation · Installing a Red Hat Network Satellite Server · Introduction to RHN Satellite - features, prerequisites · Installing Satellite Server software · Understanding software channels and entitlements · Importing channel content into a Satellite Server · - Red Hat Network

Organization · Organization management and trust relationships · Managing user accounts · Assigning user roles (security) · Managing system groups.

Unit II**(1 Credit)**

Managing Changes with Revision Control · Introducing revision control concepts · Basic Subversion repository administration RHCA Course Syllabus ipsr solutions ltd · Using Subversion to manage revisions · Red Hat Network Client Configuration · Secure communication with SSL · Red Hat Network registration · Creating and using activation keys · Registration automation with bootstrap.sh · Troubleshooting RHN registration · Red Hat Network Software Management · Software channel relationships · Cloning existing software channels · Managing custom software channels · Notifying clients of changes: managing errata · - Building RPMs ·

Unit III**(1 Credit)**

Building open source software · Using RPM macros , Writing custom spec files · Using rpmbuild to create RPMs · Signing packages for security , RHN Application Programmer Interface · Uses for Red Hat Network API · Basic RHN API program structure · Configuration File Management with Red Hat Network · Managing configuration channels · Configuration file macros ·

Unit IV**(1 Credit)**

Configuration file management using command-line tools · Provisioning with Kick-start · Anaconda kick-start options · Building a provisioning environment · Using Cobbler for provisioning · Virtual Machine Management Virtual host/virtual platform entitlements ·

Lab Practical's**(2 Credits)**

1. Install Red Hat Satellite server with Subscription Asset Manager
2. Red Hat Satellite organizations, users, and roles
3. Manage changes with revision control software
4. Manage software with Red Hat Satellite software channels and errata
5. Construction of custom RPM packages

6. Report and automation with Red Hat Satellite programming API
7. Deploy configuration files using Red Hat Satellite
8. Provision with Pre-boot Execution Environment (PXE)
9. Administer Red Hat Satellite

SDC-6.4: Internet of Things (IOT)

4 Hrs/Week

Total Credits: 04

UNIT I

(I Credit)

Introduction to IoT Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs 6 10 2 IoT & Web Technology The Internet of Things Today, Time for Convergence, Towards the IoT Universe, Internet of Things Vision, IoT Strategic Research and Innovation Directions, IoT Applications, Future Internet Technologies, Infrastructure, Networks and Communication, Processes, Data Management, Security, Privacy & Trust, Device Level Energy Issues, IoT Related Standardization, Recommendations on Research Topics.

UNIT II

(I Credit)

IoT & M2M Machine to Machine, Difference between IoT and M2M, Software define Network. Network & Communication aspects Wireless medium access issues, MAC protocol survey, Survey routing protocols, Sensor deployment & Node discovery, Data aggregation & dissemination.

M2M to IoT – A Basic Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. M2M to IoT-An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.

UNIT III

(I Credit)

Challenges in IoT Design challenges, Development challenges, Security challenges, Other challenges Domain specific applications of IoT Home automation, Industry applications, Surveillance applications, Other IoT applications.

IoT Architecture -State of the Art – Introduction, State of the art, Architecture Reference Model- Introduction, Reference Model and architecture, IoT reference Model, IoT Reference Architecture- Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views

UNIT IV**(1 Credit)**

Developing IoTs Introduction to Python, Introduction to different IoT tools, Developing applications through IoT tools, Developing sensor based application through embedded system platform, Implementing IoT concepts with python.

IoT Applications for Value Creations Introduction, IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and Serialization, IoT for Retailing Industry, IoT For Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management, health.

List of Experiments:**2 credits**

1. Define and Explain Eclipse IoT Project.
2. List and summarize few Eclipse IoT Projects.
3. Sketch the architecture of IoT Toolkit and explain each entity in brief.
4. Demonstrate a smart object API gateway service reference implementation in IoT toolkit.
5. Write and explain working of an HTTP- to-CoAP semantic mapping proxy in IoT toolkit.
6. Describe gateway-as-a-service deployment in IoT toolkit.
7. Explain application framework and embedded software agents for IoT toolkit.
8. Explain working of Raspberry Pi.
9. Connect Raspberry Pi with your existing system components.
10. Give overview of Zetta. Design based Problems (DP)/Open Ended Problem:

SDC -6.5: Project & Dissertation

6 Hrs/Week

Total Credits: 06

Purpose of the project work is :

(6 CREDITS)

(i) To develop abilities of diagnosing problems.

(ii) To develop the abilities to :

- (a) Make literature survey.
- (b) Design/develop/fabricate/test simple circuits.
- (c) Prepare documents for electronic work.
- (d) Work as a team.

1. HARDWARE PROJECT (HW): The student is expected to work on a project in consultation and acceptance with the instructor on hardware aspects related to industrial environment. The student is also expected to fabricate different cards used in PC, their testing and assembly of PC. The end targets for the project should be well defined and evaluation should place major importance on meeting these targets.

2. NETWORKING PROJECT: The student is expected to work and learn from implementing an application software and study it's functional and performance aspects and submit a report. The evaluation must be based on the project report and the seminars.

Scheme of valuation

Demo ---60 Marks

Viva voce -50

Report-40