

Curriculum for Big Database & Cloud Computing (D.Voc.)

NSQF Level	Code	Educational Component	Credit	Marks
3 (1 st Year) Semester I	Theory			
	3.GE.01	Language – I	3	50
	3.GE.02	Applied Chemistry	3	50
	3.GE.03	Applied Physics	3	50
	3.GE.04	Applied Mathematics – I	3	50
	Lab / Practical			
	3.GP.01	Applied Chemistry Lab	1.5	50
	3.GP.02	Applied Physics Lab	1.5	50
	On-Job-Training (OJT) / Qualification Packs			
	Operator – Conventional Training		(Any one)	15
IT Attendant				
Domestic Helpdesk Operator				
3 (1 st Year) Semester II	Theory			
	3.GV.01	General Foundation Course	3	50
	3.GV.02	Basic Electricity and Electronics	3	50
	3.GE.05	Language – II	3	50
	3.GE.06	Applied Mathematics – II	3	50
	Lab / Practical			
	3.VP.01	Basic Electricity and Electronics Lab	1.5	50
	3.VP.02	Language Lab	1.5	50
On-Job-Training (OJT) / Qualification Packs				
Any one of the QP's can be opted as offered in Semester I		(Any one)	15	200
4 (2 nd Year) Semester I	Theory			
	4.GV.01	Computer Organization & Architecture	3	50
	4.GV.02	Programming Concept (using C / Python)	3	50
	4.GV.03	Web Development Application	3	50
	4.GV.04	Fundamentals of Big Data & Cloud Computing	3	50
	Lab / Practical			
	4.VP.01	IT-Tools & Programming Lab (using C / Python)	1.5	50
	4.VP.02	Web Development Lab	1.5	50
	On-Job-Training (OJT) / Qualification Packs			
	Factory Network Analyst		(Any one)	15
Junior Software Developer				
Data Operator Trainee				
4 (2 nd Year) Semester II	Theory			
	4.GV.05	Database management system	3	50
	4.GV.06	Data Structure and Algorithms	3	50
	4.GV.07	Introduction to Network Management System	3	50
	4.GV.08	Introduction to Cloud Computing	3	50
	Lab / Practical			
	4.VP.03	Data Structure Lab	1.5	50
	4.VP.04	Database management system Lab	1.5	50
On-Job-Training (OJT) / Qualification Packs				

	One more QP to be opted from the QPs mentioned in the Level 4 first semester	(Any one)	15	200
5 (3rd Year) Semester I	Theory			
	5.GV.01	Distributed Database System	3	50
	5.GV.02	Information Storage Concept	3	50
	5.GV.03	Operating System	3	50
	5.GV.04	Network Security & Cryptography	3	50
	Lab / Practical			
	5.VP.01	Operating System Lab	1.5	50
	5.VP.02	Computer Network & Security Lab	1.5	50
	On-Job-Training (OJT) / Qualification Packs			
	Systems Analyst		(Any one)	15
Application Developer				
Network Analyst				
5 (3rd Year) Semester II	Theory			
	5.GV.05	Introduction of Hadoop in Big Data Analytics with NoSQL	3	50
	5.GV.06	Cloud Computing Techniques	3	50
	5.GV.07	Overview of Data Mining & Data Warehousing	3	50
	5.GV.08	Software Engineering	3	50
	Lab / Practical			
	5.VP.03	Project Work & Seminar-Presentation	3	100
	On-Job-Training (OJT) / Qualification Packs			
	One more QP to be opted from the QPs mentioned in the Level 5 first semester		(Any one)	15

Detailed Curriculum

(Level 3: 1st Year, Semester – I)

(3.GE.01): Language – I

Reading comprehension (prescribed texts) and functional grammar: A variety of genres – short stories, expository pieces, biographies, poems, plays, newspaper and magazine excerpts have been included. Teaching of grammar has been integrated with the reading texts. The emphasis is on functional grammar.

Non prescribed: In this section learners will be exposed to newspaper, articles, tables, diagrams, advertisements etc. which they have to read carefully and interpret. In the examination similar pieces will be used.

Grammar and usage. Functional writing and study skills: Paragraph writing, Letter writing, Note making, Ending (punctuation, spelling, appropriate vocabulary, structures).

Reference Books:

1. Effective Communication Skills, Kulbhushan Kumar, Khanna Publishing House
2. Business Communications, Varinder Bhatia, Khanna Publishing House

(3.GE.02): Applied Chemistry

Structure of Atom, Periodic Properties of Elements, Chemical Bonds, Fuel and their Classification, Water, Corrosion, Plastic and Polymers.

Reference Books:

1. Chemistry, Satyaprakash, Khanna Publishing House
2. Engineering Chemistry, Saiful Islam, Khanna Publishing House

(3.GE.03): Applied Physics

Units & Dimensions, Surface Tension and Viscosity, Vibrations, Heat, Ultrasonics, Optics.

Reference Books:

1. Engineering Physics, Malik and Singh, Tata Mc Graw Hill
2. Engineering Physics, Naidu, Pearson

3. Modern Physics for Engineers, S.P. Taneja, R. Chand

(3.GE.04): Applied Mathematics – I

Sets, Relations and Functions, Sequences and Series, Algebra-I, Co-ordinate Geometry, Statistics and Probability.

Reference Books:

1. Applied Mathematics-I, J.K. Tyagi, Khanna Publishing House
2. Engineering Mathematics, Reena Garg, Khanna Publishing House

(3.GP.01): Applied Chemistry Lab

1. Proximate analysis of solid fuel.
2. Experiments based on Bomb Calorimeter.
3. Determination of turbidity in a given sample.
4. To determine the flash and fire point of a given lubricating oil.
5. To determine the viscosity of a given lubricating oil by Redwood viscometer.
6. To determine cloud and pour point of a given oil.

(3.GP.02): Applied Physics Lab

1. To determine the surface tension of a liquid by rise in capillary.
2. To determine the viscosity of a given liquid.
3. To determine the frequency of tuning fork using a sonometer.
4. To determine the frequency of AC main using sonometer.
5. Time period of a cantilever.

(Level 3: 1st Year, Semester – II)

(3.GV.01): General Foundation Course

Business Management and Entrepreneurship, Computational Skills, Environmental Education, Rural Development.

Reference Books:

1. Environmental Studies, M.P. Poonia & S.C. Sharma, Khanna Publishing House
2. A Textbook of Environmental Sciences, Rimpi Mehani Ne' Chopra, Khanna PublishingHouse

(3.GV.02): Basic Electricity and Electronics

Current Electricity, D.C. Circuits, Electric Cells, Lighting Effects of Current, Capacitors, Electromagnetic Effects, A.C Circuits.

Overview of Atom, Sub-Atomic Particles and CRO, Voltage and Current, Basics of Semiconductor, Bipolar Junction Transistor, Transistor Amplifier and Applications.

Reference Books:

1. Basic Electrical Engineering, Ritu Sahdev, Khanna Publishing House
2. Basic Electrical Engineering, Pradeep Kumar, Khanna Publishing
3. Basic Electronics, S. Biswas, Khanna Publishing House
4. All in One Electronics Simplifies, A.K. Maini, Khanna Publishing House

(3.GE.05): Language – II

Listening and speaking skills, English for specific purposes (opt any one):

English for Science: 1. Health and hygiene, 2. Conservation of (nearly extinct) animals, 3. Plant life, 4. Bio gas / solar energy.

English for Receptionist: 1. Receiving messages, making request etc., 2. Supplying information, 3. Giving advice and making suggestions, 4. Dealing with complaints, 5. Making entries in an appointment book, register etc.

English for Office Use: 1. Using the telephone taking and passing messages, 2. Receiving messages, 3. Marking noting on files and circular, 4. Writing office notes, memos, notices, agendas for meetings, 5. Telegrams and fax messages, 6. Writing business letters, application enquires, complaints, 7. Filling in forms, cheques, pay in slips etc.

Reference Books:

1. Effective Communication Skills, Kulbhushan Kumar, Khanna Publishing House
2. Business Communications, Varinder Bhatia, Khanna Publishing House

(3.GE.06): Applied Mathematics – II

Algebra-II, Relations and Functions, Calculus, Vectors and Three Dimensional Geometry, Linear Programming and Mathematical Reasoning.

Reference Books:

1. Applied Mathematics-II, J.K. Tyagi, Khanna Publishing House
2. Elements of Mathematical Analysis, R. Agor, Khanna Publishing House

(3.VP.01): Basic Electricity and Electronics Lab

1. Verify that resistance of conductor is directly proportional to resistivity and length and inversely proportional to cross-sectional area of the conductor.
2. Verification of Ohm's Law.
3. Verification of temperature co-efficient of resistance:
 - (i) Positive for Tungsten and Nichrome and
 - (ii) Negative for carbon.
4. Study of series resistive circuits.
5. Study of parallel resistive circuits.
6. Study of series and parallel connection of cells in circuits.
7. Preparation of Electrolyte for lead acid battery and its charging and measurement of Specific gravity with the help of hydrometer.
8. To find heat efficiency of an electric kettle.
9. Charging and Discharging of a capacitor.
10. Verification of magnetic field of a Solenoid with:
 - (i) Iron core and
 - (ii) Air core.
11. Verification of Faraday's Laws of electromagnetic induction.
12. Verification of Torque development in a current carrying coil in magnetic field.
13. Study of R.L. series circuit and measurement of power and power factor.
14. Study of R.C. series circuit and measurement of power and power factor.
15. Study of R.L.C. series circuit and measurement of power and power factor.
16. Study of R.L.C. series circuit for calculation of inductive reactance, capacitive reactance, impedance and Q- Factor.

1. Study of current and voltage measurement using Ammeter and Voltmeter.
2. Study of current and voltage measurement using Galvanometer.
3. Study of current, voltage and resistance measurement using of Multi-meter
4. Study of Power and Energy measurement using Wattmeter and Energy meter.
5. Study of working principle of Signal Generator and measurement of amplitude, time period and frequency of signal using Oscilloscope.
6. Study of V-I Characteristic of Diode.
7. Study of V-I Characteristic of Zener Diode. And use of Zener Diode as voltage regulator.
8. Study of Half wave rectifier with and without filter circuit.
9. Study of Full wave rectifier with and without filter circuit.
10. Study CE configuration for NPN and PNP transistors and measurement of voltage and current gain.
11. Study CB configuration for NPN and PNP transistors and measurement of voltage and current gain.
12. Study CC configuration for NPN and PNP transistors and measurement of voltage and current gain.
13. Study of working of single layer PCB manufacturing
14. Study of working of double layer PCB manufacturing.
15. Design of 7 segment display using LED and bread board

(3.VP.02): Language Lab

Technical Report Writing, Language Laboratory Practice, Conversation Practice Sessions, Group Discussion Sessions, Presentation, Competitive Examination.

(Level 4: 2nd Year, Semester – I)

(4.GV.01): Computer Organization & Architecture

Basic organization of the stored program computer and operation sequence for execution of a program, Role of operating systems and compiler/assembler, Fetch, decode and execute cycle, Concept of operator, operand, registers and storage, Instruction format. Instruction sets and addressing, modes, Commonly used number systems. Fixed and floating point representation of numbers, Overflow and underflow. Design of adders – ripple carry and carry look ahead principles, Design of ALU, Memory unit design with special emphasis on implementation of CPU-memory interfacing, Memory organization, static and dynamic memory, memory hierarchy, associative memory, Cache memory, Virtual

memory, Design of control unit - hardwired and microprogrammed control, Introduction to instruction pipelining, Introduction to RISC architectures. RISC vs CISC architectures, I/O operations - Concept of handshaking, interrupt and DMA, Pipelining, Exception handling, Pipeline optimization techniques, Hierarchical memory technology, Instruction-level parallelism, Multiprocessor architecture, Non von Neumann architectures.

Reference Books:

1. Mano, M.M., "Computer System Architecture", PHI.
2. Hayes J. P., "Computer Architecture & Organisation", McGraw Hill.
3. Hamacher, "Computer Organisation", McGraw Hill.
4. Chaudhuri P. Pal, "Computer Organisation & Design", PHI.
5. P N Basu- "Computer Organization & Architecture", Vikas Pub.
6. Rajaraman – "Computer Organization & Architecture", PHI.
7. B.Ram – "Computer Organization & Architecture", Newage Publications.
8. J. L. Hennessy and D. A. Patterson, "Computer Architecture A Quantitative Approach", Morgan Kauffman.

(4.GV.02): Programming Concept (using C / Python)

Introduction, Conditional Statements, Control Statements, String Manipulation, Lists, Tuple, Dictionaries, Functions, Modules, Exception Handling.

Reference Books:

1. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill
2. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
3. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
4. Python Crash Course, 2Nd Edition: A Hands-On, Project-Based Introduction to Programming, Eric Matthes
5. Python Programming: Using Problem Solving Approach, ReemaThareja
6. Core Python Programming, R. NageswaraRao
7. Introduction to Computing and Problem Solving with Python, J. Jose, Khanna Publications

(4.GV.03): Web Development Application

Internet: brief history, Protocols and standards, Reference models, Applications and modern day usage, Network of Networks, Intranet, Extranet and Internet, Editing Tools, HTML, Customizing and Embedding Multimedia components in Web Pages, Scripting Language Work Integrated Learning IT, Web Page development with PHP, UI design, CSS

Reference Books:

1. Internet & Web Development, Soma Das Gupta, Khanna Publishing House
2. Web Designing and Development, TanweerAlam, Khanna Publishing House
3. Achyut S Godbole and Atul Kahate, "Web Technologies", Second Edition, Tata McGraw Hill,
4. Steven Holzner, "The Complete Reference - PHP", Tata McGraw Hill, 2008
5. James Lee, Brent Ware, "Open Source Development with LAMP: Using Linux, Apache, MySQL, Perl, and PHP" Addison Wesley, Pearson 2009.

(4.GV.04): Fundamentals of Big Data & Cloud Computing

Big data definition, Concept of structured data, social or unstructured data, Need of unstructured data for analytics, Concept of Big Data to Deal with voluminous data, Source of Big Data, Industries using Big Data, Big Data challenges., Definition of Cloud Computing, Characteristics of cloud computing, Cloud Computing Components, Cloud provider, Concept of SAAS, PAAS, IAAS and other Organizational scenarios of clouds, Benefits & Limitations of Cloud Computing

Reference Books:

1. Big Data Fundamentals – Concepts Drivers and Techniques by ERL/Khattak/Buhler
2. Big Data: Concepts, Technology and Architecture by Balarugan Balusamy, Nandhini Abirami R, Seifedine Kadry and Amir Gandomi
3. Cloud Computing: Principles and Paradigms, Rajkumar Buyya, James Broberg, Andrzej M Goscinski
4. Brief Guide to Cloud Computing, Christopher Barnett

(4.VP.01): IT-Tools & Programming Lab (using C / Python)

Spreadsheets, Word, Presentation, Multimedia Design, Troubleshooting, Study of computer components, Booting of Computer and its shutdown, Practicing some fundamental DOS Commands, Simple Programs in BASIC to compute

Mean, Variance, Correlation and Regression, Creating database in MS-Access, structuring with different types of fields and use of query facility for accessing the information, Project / Practical File, Viva Voce.

Interactive interpreter and Python Script, Indentation Error, decision making and looping, one dimensional and two dimensional arrays, explore string functions, mean, median, mode, find all duplicates in the list, find all unique elements of a list, compute gcd, lcm of two numbers, use of Lists, Dictionaries, implement Turtle, Linear and Binary Search, Exceptions in Python.

(4.VP.02): Web Development Lab

Internet basics, WEB SERVER, Concept and familiarity of various internet services (www, http, ftp, chat etc), Concept of HTML, Web Page development with PHP, Concept of Static & Dynamic Page, Database Management through ASP, Create a static web pages, Implement hyperlinking between two html pages

Reference Books:

1. “Web Technologies”, Jackson, Pearson
2. “Web Technologies”, Godbole, TMH
3. “Web Technologies”, Uta K Roy, Oxford

(Level 4: 2nd Year, Semester – II)

(4.GV.05): Database Management Systems

Database system architecture, Data models, Structured and Unstructured data, SQL Commands (DDL, DML & DCL), Relational query languages, Relational database design, Query processing and optimization, Storage strategies, Transaction processing, Database Security, Advanced topics.

Reference Books:

1. “Database System Concepts”, 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill.
2. “Principles of Database and Knowledge – Base Systems”, Vol 1 by J. D. Ullman, Computer Science Press.
3. Database Management Systems, R.P. Mahapatra, Khanna Publishing House, New Delhi.
4. “Fundamentals of Database Systems”, 5th Edition by R. Elmasri and S. Navathe.
5. Pearson Education “Foundations of Databases”, Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, Addison-Wesley

(4.GV.06): Data Structures & Algorithms

Program structures, Variables, Data Types, Declarations, Operators (Arithmetic, Relational, Logical), increment and decrement operators, Assignment operators and expressions, Arithmetic expressions, Functions, external variables, scope rules, header files, Pointers and addresses, pointers and function arguments, pointer and arrays, Data Structures: Arrays, Linked list, Stacks and queues, Trees, Graphs, Hashing, Searching & Sorting.

Reference Books:

1. Fundamentals of Data Structures, Sartaj Sahni, University Press
2. Data Structures through C, Yashwant Kanetkar, BPB Publications
3. Data Structures Through C In Depth, S.K.Srivastava/Deepali Srivastava
4. Data Structures using C & C++, Rajesh K. Shukla
5. Introduction to Algorithms, Thomas H. Cormen

(4.GV.07): Introduction to Network Management System

Data communication Components: Representation of data and its flow Networks, Various Connection Topology, Protocols and Standards, OSI model, Transmission Media, LAN: Wired, Wireless, Connecting LAN and Virtual LAN, Bandwidth utilization: Multiplexing - Frequency division, Time division and Wave division, Concepts on spread spectrum, Data Link Layer and Medium Access Sub Layer: Error Detection and Error Correction - Fundamentals, Network Layer: Switching, Logical addressing – IPV4, IPV6; Address mapping, Transport Layer: Process to Process Communication, User Datagram Protocol (UDP), Transmission Control Protocol (TCP), Application Layer: Domain Name Space (DNS), DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, Bluetooth, Firewalls, Basic concepts of Cryptography.

Reference Books:

1. Behrouz A. Forouzan, “Data Communications Networking”, TMH Publication.

2. James F. Kurose & Keith W. Ross, "Computer Networking: A Top-Down Approach", Pearson.
3. William Stallings, "Data and Computer Communication", Pearson Education.
4. Larry L. Peterson & Bruce S. Davie, "Computer Networks: A Systems Approach", Morgan Kaufmann / Elsevier.
5. A.S. Tanenbaum, D.J. Wetherall, "Computer Networks", Pearson Education.

(4.GV.08): Introduction to Cloud Computing

Concept of Cloud computing with its origin, Cloud Characteristics Cloud Components , On-demand self- service, Cloud network access , Location independent resource pooling , Measured service, Roots of cloud computing, Comparing cloud providers with traditional IT service providers

Reference Books:

1. Cloud Computing Bible by Barrie Sosinsky, Wiley India Pvt. Ltd, 2013.
2. The Basics Of Cloud Computing: Understanding The Fundamentals Of Cloud Computing In Theory And Practice, Rountree, D. & Castrillo Human-Computer Interaction, Alan Dix
3. Cloud Computing, Miller, Pearson.
4. Cloud Computing, Kumar Saurabh, Wiley India.
5. Cloud computing: A practical approach, Anthony T. Velte, Tata Mcgraw-Hill.

(4.VP.03): Data Structure Lab

Implement stack, Write functions like push, pop, Initialize, Empty or Full, Implement concept of queues, Implement queues in a circular array, Implement queues as a circular linked list, Implementing doubly linked list, Binary search tree to sort an array, Different types of sorting .

(4.VP.04): Database Management System Lab

Programs / Practical Questions, SQL Queries, Creating Database, Table and Record Handling, Retrieving Data from a Database, Clause, Database Management, Cursors in Oracle PL / SQL, Writing Oracle PL / SQL Stored Procedures, Programs, Operating Web Based Application, Project / Practical File, Viva Voce.

(Level 5: 3rd Year, Semester – I)

(5.GV.01): Distributed Database System

Introduction; Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas. Distributed Database Architecture: **Architectural Models for Distributed DBMS, DDMBS Architecture.** Distributed Database Design: Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation, Query processing and decomposition, Distributed query Optimization, Transaction Management, Distributed DBMS Reliability, Parallel Database Systems, Distributed object Database Management Systems, Object Oriented Data Model:

Reference Books:

1. "Database Systems: The Complete Book", Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom ,Pearson
2. "Principles of Distributed Database Systems", Ozsu, Pearson
3. "Distributed Database Mangement Systems, Rahimi & Haug, Wiley

(5.GV.02): Information Storage Concept

Introduction to Storage Technology: Information Storage - Data, Types of Data, Information, Storage, Evolution of Storage Technology and Architecture, Data Center Infrastructure, Key Challenges in Managing Information, Information Lifecycle -Information Lifecycle Management, ILM Implementation, ILM Benefits, Data Protection & Intelligent Storage System:Components of a Storage System Environment, RAID -Implementation of RAID, RAID Array Components, RAID levels, RAID Impact on Disk Performance, Components of an Intelligent Storage System, Intelligent Storage Array-High-end Storage Systems, Midrange Storage System, Storage Networking Technologies & Virtualization, Backup, Recovery & Replication

Reference Books:

1. Information Storage and Management, Wiley Publication Introduction to Embedded Systems, Raj Kamal, Tata McGraw Hill
2. Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill

(5.GV.03): Operating System

System Software: Operating System, Compiler, Interpreter and Assembler, Operating System: Need for Operating System, Functions of Operating System (Processor Management, Memory Management, File Management and Device Management), Types of Operating System-Interactive (GUI based), Time Sharing, Real Time and Distributed, commonly used Operating System: UNIX, LINUX, Windows, Solaris, BOSS (Bharat Operating System Solutions); Mobile OS – Android, Symbian, IOS. Utility Software: Anti-Virus, File Management tools, Compression tools and Disk Management tools (Disk Cleanup, Disk Defragmenter, Backup). Processes, Thread, Process Scheduling, Inter-process Communication, Deadlocks, Memory Management, Virtual Memory, I/O Hardware, File Management, Disk Management.

Reference Books:

1. Operating Systems, Ekta Walia, Khanna Publishing House.
2. Operating System Concepts Essentials, Avi Silberschatz, Peter Galvin, Greg Gagne, Wiley Asia Student Edition.
3. Operating Systems: Internals and Design Principles, William Stallings, Prentice Hall of India.
4. Operating Systems: A Modern Perspective, Gary J. Nutt, Addison-Wesley.

(5.GV.04): Network Security & Cryptography

Introduction & Number theory, Block ciphers & Public key cryptography, Hash functions and Digital signatures, Security practice & system security, E-mail, IP & Web security.

Reference Books:

1. “Cryptography and Network Security”, William Stallings, Pearson Education Asia.
2. “Network Security private communication in a public world”, C. Kaufman, R. Perlman and M. Speciner, Pearson.
3. Cryptography & Network Security: Atul Kahate, TMH.
4. “Network Security Essentials: Applications and Standards”, William Stallings, Pearson.

(5.VP.01): Operating System Lab

Understanding syntax, Interpretation ,Execution of commands, Identify the major desktop components, interfaces and their functions .Differentiate the various Windows Operating system.(Windows 9x,Windows NT, Windows 2000& Windows XP, Use of file and directory manipulation commands – ls, rm, mv, cp, join, split, cat, head, tail,touch, diff,comm., pr, chmod, mkdir, rmdir, cd, pwd, dir, cmp., Use of text processing and communication commands – tr, wc, cut, paste, spell, sort, grep, msg, talk, wall,write, who, who am i ,news, mail, Use of general purpose and process commands- ps, wait, sleep, exit, kill, bc, date, time, cal, clear,banner, tty, script, su, man.,Use of vi editor & perform all editor commands, Shell Programming, System Administration

(5.VP.02): Computer Network & Security Lab

Network Topologies and Networking Devices, Installing Windows 2003 Server &UNIX / Linux, Compare different Network Topologies, Compare Network directing devices: (Hub, Switch, Router), To study crimping: RJ-45, RJ-11, Cross-over Cable and Create a Network cable using RJ45 connectors, Locate MAC address of computer , make a peer-to-peer Network System, Implementing a TCP/IP Network configuring, Loop base testing, Idea of socket,Experiments with: Ceaser Cipher Encryption/Decryption, Monoalphabetic Encryption/Decryption, Polyalphabetic Cipher, Playfair Cipher, Hill Cipher, Diffie Hellman Key Exchange, RSA Encryption Decryption, Triple-DES Encryption Decryption.

(Level 5: 3rd Year, Semester – II)

(5.GV.05): Introduction of Hadoop in Big Data Analytics with NoSQL

Introduction, to Big data and NoSQL , Types of Digital Data, Big data in Hadoop environment, concept of dta science, rdbms versus hadoop, introduction & features of cassandra, introductory concept of to mapreduce programming (overview), overview of hive architecture,

Reference Books:

1. “Big data Analytics “, Radha Shankarmani & M. Vijayalakshmi, , Wiley.
2. “Understanding Big Data”, Chriss Eaton, Dirik Deroos, Tom Deutsch, George Lapis, Paul Zikopoulos, McGraw-Hill.

(5.GV.06): Cloud Computing Technique

Cloud Insights,,: Architectural influences – High-performance computing, Utility and Enterprise grid computing, Cloud scenarios – Benefits: scalability ,simplicity ,vendors ,security, Limitations – Sensitive

information - Application development, Cloud Architecture- Layers and Models: Layers in cloud architecture, Software as a Service (SaaS), features of SaaS and benefits, Platform as a Service (PaaS), features of PaaS and benefits, Infrastructure as a Service (IaaS), features of IaaS and benefits, Service providers, challenges and risks in cloud adoption, Cloud Simulators- CloudSim and Green Cloud, Introduction to VMWare Simulator

Reference Books:

1. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert Elsenpeter, TATA McGraw- Hill
2. Cloud Computing (Principles and Paradigms), Edited by Rajkumar Buyya, James Broberg, Andrzej Goscinski, John Wiley & Sons,

(5.GV.07): Overview of Data Mining & Data Warehousing

Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data Warehouse System, Major issues in Data Mining. Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation., Data Warehouse and OLAP Technology for Data Mining: Data Warehouse, Multidimensional ,Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining Data Cube Computation and Data Generalization: Efficient Methods for Data Cube Computation, Development of Data Cube and OLAP Technology, Attribute-Oriented Induction, Classification, Clustering Methods

Reference Books:

1. “Introduction to Data Mining “, Pang-Ning Tan, Michael Steinbach and Vipin Kumar,Pearson
2. “Data Mining Techniques”, Arun K Pujari, Universities Press

(5.GV.08): Software Engineering

Overview of Software Engineering & the Software Development Process, Software process , Understanding Requirements, Software Engineering requirements & Development of Analysis & Design models, Software Testing Strategies, Software Project Management, Software Quality Management& Estimation

Reference Books:

1. . “ Fundamental of Software “, Rajib Mall, PHI
2. . “Software Engineering ”, Roger S PressmanTata McGraw- Hill
3. . “Software Engineering” , I Sommerville, Addison Wesley,

(5.VP.03): Project Work & Seminar-Presentation

On the basis of learning in the Diploma of Vocational, a project to be taken up by the student strengthening his/ her vocational skills.
