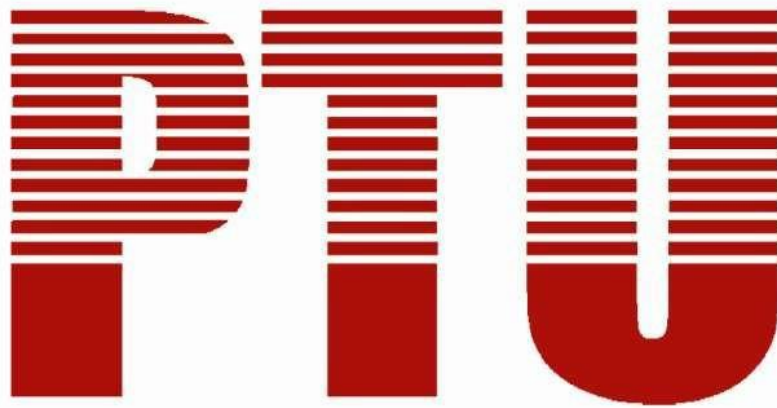


**Scheme & Syllabus of
Bachelor of Vocational Studies
(B.Voc.)
Networking & System Administration
Batch 2019**



By
Department of Academics
IKG Punjab Technical University

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Semester 1st

Course Code	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BVNS101-19	PC Hardware	3	0	40	60	100	3
BVNS102-19	Computer Networking	3	0	40	60	100	3
BVNS103-19	Communicative English	3	0	40	60	100	3
BVNS104-19	Basic IT Skills	3	0	40	60	100	3
BVNS105-19	PC Hardware Laboratory	0	3	30	20	50	1.5
BVNS106-19	Computer Networking Laboratory	0	3	30	20	50	1.5
On-Job Training / Qualification Pack*							
BVNS107-19	Test Engineer (SSC/Q1301)	On Job Training (OJT) in Collaboration with MoU industry		200	200	200	15
Total		12	6	220	480	700	30

*The qualification packs may vary from institute to institute.

Semester 2nd

Course Code	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BVNS201-19	Database Management Systems	3	0	40	60	100	3
BVNS202 -19	Object Oriented Programming using C++	3	0	40	60	100	3
BVNS203-19	Computer System Architecture	3	0	40	60	100	3
BVNS204-19	Mathematics	3	0	40	60	100	3
BVNS205-19	Database Management Systems Laboratory	0	3	30	20	50	1.5
BVNS206-19	Object Oriented Programming using C++ Laboratory	0	3	30	20	50	1.5
On-Job Training / Qualification Pack*							
BVNS207-19	Security Analyst (SSC/Q0901)	On Job Training (OJT) in Collaboration with MoU industry		200	200	200	15
Total		12	6	220	480	700	30

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Course Code: **BVNS101-19**

Course Name: **PC Hardware**

Program: B. Voc.	L: 3 T: 0 P: 0
Branch: Networking & System Administration	Credits: 3
Semester: 1st	Contact hours: 33
Theory/Laboratory: Theory	Elective status: Core
Internal max. marks: 40	External max. marks: 60
Total marks: 100	

Course Outcomes:

CO#	Course outcomes
CO1	To Identify the hardware components of a computer including names and functions of hardware ports and the parts of the motherboard.
CO2	To identify the peripheral devices outside computer & to Search PC for the various hardware components it contains.
CO3	To identify the software's running on a computer.
CO4	To equip the students about the Basic of how Computer is assembled and troubleshooting it.

Detailed contents	Contact hours
Unit 1: Assemble/setup and upgrade personal computer systems: computer system modules/ components and its operations, need of hardware and software for computer to work, different hardware components within a computer and connected to a computer as peripheral devices, type of computer bus structures, different processors used for personal computers and note book computers	9
Unit 2: Perform installation, configuration, and upgrading of microcomputer: Hardware and software requirement, Assemble/setup microcomputer systems, accessory boards, types of motherboards, selection of right motherboard, Installation & replacement of motherboard, troubleshooting problems with memory.	8
Unit 3: Install/connect associated peripherals: Working of printers and scanners, Installation of printers and scanners, sharing a printer over a local area network, troubleshooting printer and scanner problems, troubleshooting hard drive problems.	8
Unit 4: Diagnose and troubleshooting of microcomputer systems hardware & software and other peripheral equipment: Approaches to solve a PC problem, troubleshooting a failed boot before the OS is loaded, different approaches to installing and supporting I/O device, managing faulty components.	8

Text Books:

1. PC Hardware: The Complete Reference, McGraw-Hills.
2. The Indispensable PC Hardware Book (4th Edition) Hans-Peter Messmer.

Reference Books:

1. PC Hardware: A Beginner's Guide by Ron Gilster.

Course Code: **BVNS102-19**

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Course Name: **Computer Networking**

Program: B. Voc.	L: 3 T: 0 P: 0
Branch: Networking & System Administration	Credits: 3
Semester: 1st	Contact hours: 33
Theory/Laboratory: Theory	Elective status: Core
Internal max. marks: 40	External max. marks: 60
Total marks: 100	

Course Outcomes:

CO#	Course outcomes
CO1	Familiar with the different Network Models.
CO2	Understand different protocols working at Medium Access Sub-layer.
CO3	Learn the concept of network routing through algorithms.
CO4	Learn and understand Internet protocols and network security.

Detailed contents	Contact hours
Unit 1 : Data Communications Concepts: Digital and analog transmissions-Modem, parallel and serial, synchronous and asynchronous, Modes of communication: Simplex, half duplex, full duplex, Concept of multiplexing, De-multiplexing. Types of Networks: LAN, MAN, WAN Network Topologies: Bus, Star, Ring, Mesh, Tree, Hybrid Communication Channels: Wired transmissions: Telephone lines, leased lines, switch line, coaxial cables-base band, broadband, optical fiber transmission.	9
Unit 2 : Transmission Media: Guided Media(Twisted Pair Cable, Coaxial Cable, Fiber Optics Cable), Unguided Media (Radio Waves, Microwaves, Infrared) Communication Devices (Switches, Hub, Routers, gateway etc) Introduction to Switching: Circuit Switch Networks, Datagram Switch Networks Network Models.	8
Unit 3 : Introduction to OSI Model – Physical Layer, Data Link Layer, Network Layer, Transport Layer, Session Layer, Presentation Layer TCP/IP (Layer Architecture) Data Link Layer, Internet Layer, Transport Layer, Application Layer	8
Unit 4 : MAC sub layer: 802.4Token Bus, IEEE 802.5 Token Ring Concept of Internetworking.	8

Text Books:

1. Computer Networks, Tanenbaum, Andrew, Fifth Edition, PHI.
2. Data Communication and Networking, Behrouz A. Forouzan, Fourth Edition.
3. Computer Today, S.K. Basandra, First Edition, Galgotia.

Reference Books:

1. Data Communication System, Black, Ulysse, Third Edition, PHI.
2. Data and Computer Communications, Stalling, Ninth Edition, PHI.

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Course Code: **BVNS103-19**

Course Name: **Communicative English**

Program: B. Voc.	L: 3 T: 0 P: 0
Branch: Networking & System Administration	Credits: 3
Semester: 1st	Contact hours: 33
Theory/Laboratory: Theory	Elective status: Core
Internal max. marks: 40	External max. marks: 60
Total marks: 100	

Course Outcomes:

CO#	Course outcomes
CO1	To introduce students to the theory, fundamentals and tools of communication.
CO2	To help the students become the independent users of English language.
CO3	To develop vital communication skills integral to their personal, social and professional interactions.
CO4	The syllabus shall address the issues relating to the Language of communication.
CO5	Students will become proficient in professional communication such as interviews, group discussions, office environments, important reading skills and writing skills.

Detailed contents	Contact hours
Unit1- 1 (Introduction) <ul style="list-style-type: none"> • Theory of Communication, • Types and modes of Communication 	9
Unit- 2 (Language of Communication) <ul style="list-style-type: none"> • Verbal and Non-verbal • (Spoken and Written) • Personal, Social and Business • Barriers and Strategies • Intra-personal, Inter-personal and Group communication 	8
Unit-3 (Reading and Understanding) <ul style="list-style-type: none"> • Close Reading • Comprehension • Summary Paraphrasing • Analysis and Interpretation • Translation(from Hindi/Punjabi to English and vice-versa) • Literary/Knowledge Texts 	8
Unit-4 (Writing Skills) <ul style="list-style-type: none"> • Documenting • Report Writing • Making notes • Letter writing 	8

Text Books:

1. Fluency in English - Part II, Oxford University Press, 2006.
2. Business English, Pearson, 2008.

Reference Books:

1. Practical English Usage by Michael Swan. OUP. 1995.
2. Communication Skills by Sanjay Kumar and Pushp Lata. Oxford University Press. 2011.

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Course Code: **BVNS104-19**

Course Name: **Basic IT Skill**

Program: B. Voc.	L: 3 T: 0 P: 0
Branch: Networking & System Administration	Credits: 3
Semester: 1st	Contact hours: 33
Theory/Laboratory: Theory	Elective status: Core
Internal max. marks: 40	External max. marks: 60
Total marks: 100	

Course Outcomes:

CO#	Course outcomes
CO1	Understanding the concept of input and output devices of Computers.
CO2	Learn the functional units and classify types of computers, how they process information and how individual computers interact with other computing systems and devices.
CO3	Learn basic word processing, Spreadsheet and Presentation Graphics Software skills.
CO4	Study to use the Internet safely, legally, and responsibly.
CO5	To develop an understanding and practical exposure to different IT tools used as an aid in business and ecommerce.

Detailed contents	Contact hours
<p>Unit 1 : Human Computer Interface, Concepts of Hardware and Software; Data and Information. Functional Units of Computer System: CPU, registers, system bus, main memory unit, cache memory, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors. Devices: Input and output devices, keyboard, mouse, joystick, scanner, OCR, OMR, bar code reader, web camera, monitor, printer, plotter. Memory: Primary, secondary.</p>	9
<p>Unit 2: Types of Languages: Machine, assembly and High level Language; Operating system as user interface, utility programs. Word processing: Editing features, formatting features, saving, printing, table handling, page settings, spell-checking, macros, mail-merge, equation editors.</p>	8
<p>Unit 3: Spreadsheet: Workbook, worksheets, data types, operators, cell formats, freeze panes, editing features, formatting features, creating formulas, using formulas, cell references, replication, sorting, filtering, functions, Charts & Graphs. Presentation Graphics Software: Templates, views, formatting slide, slides with graphs, animation, using special features, presenting slide shows.</p>	8
<p>Unit 4: The Impact of Computing and the Internet on Society. Electronic Payment System: Secure Electronic Transaction, Types of Payment System: Digital Cash, Electronic Cheque, Smart Card, Credit/Debit Card E-Money, Immediate Payment System (IMPS).</p>	8

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Text Books:

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2. Computer Fundamentals, A. Goel, 2010, Pearson Education.
3. Fundamentals of Computers, P. K.Sinha& P. Sinha, 2007, BPB Publishers.

Reference Books:

1. Introduction to Computers by Peter Norton.
2. Computers Today by D. H. Sanders, McGraw Hill.
3. Computers by Larry long & Nancy long, 12th edition, Prentice Hall.

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Course Code: **BVNS105-19**

Course Name: **PC Hardware Laboratory**

Program: B. Voc.	L: 0 T: 0 P: 3
Branch: Networking & System Administration	Credits: 1.5
Semester: 1st	Percentage of numerical/design problems:-
Theory/Laboratory: Laboratory	Duration of end semester exam (ESE):-
Internal max. marks: 30	External max. marks: 20
Total marks: 50	Status (Elective/Core): Core

Course Outcomes:

CO#	Course outcomes
CO1	Perform a step by step assembly of a desktop computer.
CO2	Explain, install, and navigate an operating system; upgrade components based on needs and perform preventive maintenance and advanced troubleshooting.
CO3	Perform installation of various types of system software's & utility software's.

Task 1 :	Assembling and De Assembling of Computer System
Task 2 :	Loading and configuration procedure of Microsoft Client O/S Win XP /Win 7 and Windows 8
Task 3 :	Installation of utility tools (Software and Drivers)
Task 4 :	Firewall configuration, Antivirus/Internet security loading and configuration procedure
Task 5 :	Installation and configuration of , I/O devices – Printers , Webcams , Scanners, Digital Camera , USB Wifi , USB BT, USB Storages , Projectors
Task 6 :	Multiple OS loading and trouble shooting

Recommended Hardware:

Scrap CPUs, Scrap PC Cabinet, SMPS and other basic components, Scrap Motherboard and Different Types of Processors, Scrap RAM, Desktop PC without loading OS, Scrap UPS, Laptop.

Text Books:

1. PC Hardware: The Complete Reference, McGraw-Hills.
2. The Indispensable PC Hardware Book (4th Edition) Hans-Peter Messmer.

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Course Code: **BVNS106-19**

Course Name: **Computer Networking Laboratory**

Program: B. Voc.	L: 0 T: 0 P: 3
Branch: Networking & System Administration	Credits: 1.5
Semester: 1st	Percentage of numerical/design problems:-
Theory/Laboratory: Laboratory	Duration of end semester exam (ESE):-
Internal max. marks: 30	External max. marks: 20
Total marks: 50	Status (Elective/Core): Core

Course Outcomes:

CO#	Course outcomes
CO1	To execute and evaluate network administration commands and demonstrate their use in different network scenarios.
CO2	To demonstrate the installation and configuration of network simulator.
CO3	Demonstrate and measure different network scenarios and their performance behavior.

Task 1 :	Preparing Computer Network Cable using Connectors and Networking tools
Task 2 :	LAN & WAN Connectivity using Hub, Switch and Router
Task 3 :	Installation of Windows and Server
Task 4 :	Sharing Peripheral Devices.
Task 5 :	Configuration of Network Connectivity
Task 6 :	Troubleshooting of Computer Hardware and Network

Recommended Hardware:

Simple Network Components, Networking Components like Switch, Router, Hub, NIC, PC/Laptop, Router, Connectivity Network lab

Text Books:

1. Computer Networks, Tanenbaum, Andrew, Fifth Edition, PHI.
2. Data Communication and Networking, Behrouz A. Forouzan, Fourth Edition.
3. Computer Today, S.K. Basandra, First Edition, Galgotia.

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Course Code: **BVNS201-19**

Course Name: **Database Management Systems**

Program: B. Voc.	L: 3 T: 0 P: 0
Branch: Networking & System Administration	Credits: 3
Semester: 2nd	Contact hours: 33
Theory/Laboratory: Theory	Status (Elective/Core): Core
Internal max. marks: 40	External max. marks: 60
Total marks: 100	

Course Outcomes:

CO#	Course outcomes
CO1	Understand the basic concepts of DBMS.
CO2	Formulate, using SQL, solutions to a broad range of query and data update problems.
CO3	Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.
CO4	Understand the concept of Transaction and Query processing in DBMS.

Detailed Contents	Contact hours
Unit-I: Introduction of DBMS, Data Modeling for a Database, Three level Architecture of DBMS, Components of a DBMS. Introduction to Data Models, Hierarchical, Network and Relational Model, Comparison of Network, Hierarchical, Relational & Entity Relationship Model.	9
Unit-II Relational Database, Relational Algebra and Calculus, SQL Fundamentals, DDL, DML, DCL, PL/SQL Concepts, Cursors, Stored Procedures, Stored Functions, Database Triggers.	8
Unit-III Introduction to Normalization, First, Second, Third Normal Forms, Dependency Preservation, Boyce-Codd Normal Form, Multi-valued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form, Domain-key normal form (DKNF).	8
Unit-IV Database Recovery, Concurrency Management, Database Security, Integrity and Control. Structure & Design of a Distributed Database.	8

Text Books:

1. An Introduction to Database System by Bipin C. Desai, Galgotia Publications Pvt Ltd-New Delhi, Revised Edition, (2012).
2. An Introduction to Database Systems by C. J. Date, A. Kannan & S. Swamynathan, 8th Edition, Pearson Education, (2006).

Reference Books:

1. SQL, PL/SQL The Programming Language of Oracle”, Ivan Bayross, BPB Publications, 4th Revised Edition (2009).
2. Database System Concepts by Abraham Silberschatz, Henry F. Korth & S. Sudharshan, Tata McGraw Hill, 6th Edition, (2013).
3. Database Management Systems, Raghu Ramakrishnan, McGraw-Hill, 3rd Edition, 2014.

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Course Code: **BVNS202-19**

Course Name: **Object Oriented Programming using C++**

Program: B. Voc.	L: 3 T: 0 P: 0
Branch: Networking & System Administration	Credits: 3
Semester: 2nd	Contact hours: 33
Theory/Laboratory: Theory	Status (Elective/Core): Core
Internal max. marks: 40	External max. marks: 60
Total marks: 100	

Course Outcomes:

CO#	Course outcomes
CO1	To learn programming from real world examples.
CO2	To understand Object oriented approach for finding Solutions to various problems with the help of C++ language.
CO3	To create computer based solutions to various real-world problems using C++.
CO4	To learn various concepts of object oriented approach towards problem solving.

Detailed Contents	Contact hours
Unit-I Principles of object oriented programming: Introduction to OOP and its basic features, Basic components of a C++, Program and program structure, Compiling and Executing C++ Program. Difference between Procedure Oriented Language(C) and Object Oriented Language.	9
Unit-II Classes & Objects and Concept of Constructors: Defining classes, Defining member functions, Declaration of objects to class, Access to member variables from objects, Different forms of member functions, Access specifiers (Private, public, protected), Array of objects. Introduction to constructors, Parameterized constructors, Copy Constructor, Multiple constructors in class, Dynamic initialization of objects, Destructors.	8
Unit-III Inheritance and Operator overloading: Introduction to Inheritance, Types of inheritance: - Single inheritance, Multiple inheritance, Multilevel inheritance, Hierarchical inheritance, Hybrid inheritance, Defining operator overloading, Overloading of Unary and Binary operators, Rules for overloading operators.	8
Unit-IV Polymorphism and File Handling: Early Binding, Late Binding, Virtual Functions, pure virtual functions, Abstract Classes. Opening and Closing File, Reading and Writing a file.	8

Text Books:

- Object Oriented Progg. with C++, E. Balagurusami, Fourth Edition, Tata Mc-Graw Hill.
- Object Oriented Progg. in Turbo C++, Robert Lafore, 4th Edition Galgotia Publications.

Reference Books:

- C++ Progg. Language, Bjarna Stroustrup, 3rd Edition, Addison Wesley Publishing Comp.
- Object Oriented Progg. Using C++, Salaria, R. S, Fourth Edition, Khanna Book Publishing.

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Course Code: **BVNS203-19**

Course Name: **Computer System Architecture**

Program: B. Voc.	L: 3 T: 0 P: 0
Branch: Networking & System Administration	Credits: 3
Semester: 2nd	Contact hours: 33
Theory/Laboratory: Theory	Status (Elective/Core): Core
Internal max. marks: 40	External max. marks: 60
Total marks: 100	

Course Outcomes:

CO#	Course outcomes
CO1	To know about the basic functioning of various parts of computer system from hardware point of view and interfacing of various peripheral devices used with the system.
CO2	To learn number system and various types of micro-operations of processor.
CO3	To learn the communication of various components through common bus.
CO4	To learn how to design Combinational & Sequential circuits.

Detailed Contents	Contact hours
Unit-I Logic Gates: AND, OR, NOT, NAND, NOR, XOR, XNOR, NAND & NOR as Universal Gates, Logic Gates Applications. Boolean Algebra: Introduction, Theorems, Simplification of Boolean Expression using Boolean Algebra, SOP & POS Forms, Realization of Boolean Expression using Gates, K-Maps, Simplification of Boolean Expression using K-Maps.	9
Unit-II Combinational Logic Circuits: Half Adder & Half Subtractor, Full Adder & Full Subtractor, Parallel Binary Adder, Binary Adder/Subtractor. Combinational Logic Circuits: Multiplexers & Demultiplexers, Implementation of Boolean equations using Multiplexer and Demultiplexer, Encoders & Decoders.	8
Unit-III Sequential Logic Circuits: Latch, Flip Flops- R-S Flip-Flop, J-K Flip-Flop, Race Around Condition, Removing Race Around Condition, Master-Slave JK Flip-Flop, D Flip-Flop, T Flip-Flop, Applications of Flip-Flops.	8
Unit-IV Introduction to Computer Organization: Introduction to Computer and CPU (Computer Organization, Computer Design and Computer Architecture), Stored Program Concept- Von Neumann Architecture, Harvard Architecture, RISC and CISC Architecture. Register Transfer and Micro operations: Introduction to Registers, Instruction Format, Types of Instructions- Memory Reference Instructions, Register Reference Instructions and Input-Output Instructions. Common Bus System: Introduction to Common Bus System, Types of Buses (Data Bus, Control Bus, Address Bus), 16-bit Common Bus System--Data Movement among registers using Bus.	8

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Text Books:

1. Computer System Architecture, M.M. Mano, Third Edition, PHI.
2. Digital Computer Electronics, Malvino, Second Edition, Mc-Graw Hill.
3. Modern Digital Electronics, R. P. Jain, Fourth Edition, TMH.

Reference Books:

1. Computer Organization and Architecture, Stallings, Eighth Edition, PHI.
2. Computer Organization and Architecture, J.P.Hayes, Third Edition, TMH.
3. Digital and Electronic Circuits, T. C. Bartee, McGraw Hill.

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Course Code: **BVNS204-19**

Course Name: **Mathematics**

Program: B. Voc.	L: 3 T: 0 P: 0
Branch: Networking & System Administration	Credits: 3
Semester: 2nd	Contact hours: 33
Theory/Laboratory: Theory	Status (Elective/Core): Core
Internal max. marks: 40	External max. marks: 60
Total marks: 100	

Course Outcomes:

CO#	Course outcomes
CO1	Represent data using various mathematical notions.
CO2	Explain different terms used in basic mathematics.
CO3	Describe various operations and formulas used to solve mathematical problems.

Detailed Contents	Contact hours
Unit-I Set Introduction, Objectives, Representation of Sets (Roster Method, Set Builder Method), Types of Sets (Null Set, Singleton Set, Finite Set, Infinite Set, Equal Set, Equivalent Set, Disjoint Set, Subset, Proper Subset, Power Set, Universal Set) and Operation with Sets (Union of Set, Intersection of Set, Difference of Set, Symmetric Difference of Set) Universal Sets, Complement of a Set.	9
Unit-II Logic Statement, Connectives, Basic Logic Operations (Conjunction, Disjunction, Negation) Logical Equivalence/Equivalent Statements, Tautologies and Contradictions.	8
Unit-III Matrices Introduction, Types of Matrix (Row Matrix, Column Matrix, Rectangular Matrix, Square Matrix, Diagonal Matrix, Scalar Matrix, Unit Matrix, Null Matrix, Comparable Matrix, Equal Matrix), Scalar Multiplication, Negative of Matrix, Addition of Matrix, Difference of two Matrix, Multiplication of Matrices, Transpose of a Matrix.	11
Unit-IV Progressions Introduction, Arithmetic Progression, Sum of Finite number of quantities in A.P, Arithmetic Means, Geometric Progression, Geometric Mean.	11

Text Books:

1. Discrete Mathematics and Its Applications by Kenneth H. Rosen, Mc Graw Hill, 6th Edition.
2. College Mathematics, Schaum's Series, TMH.

Reference Books:

1. Elementary Mathematics, Dr. RD Sharma.
2. Comprehensive Mathematics, Parmanand Gupta.
3. Elements of Mathematics, ML Bhargava.

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Course Code: **BVNS205-19**

Course Name: **Database Management Systems Laboratory**

Program: B.Voc	L: 0 T: 0 P: 3
Branch: Networking & System Administration	Credits: 1.5
Semester: 2nd	
Theory/Laboratory : Laboratory	Percentage of numerical/design problems:-
Internal max. marks: 30	Duration of end semester exam (ESE):-
External max. marks: 20	Status (Elective/Core): Core
Total marks: 50	

Course Outcomes:

CO#	Course outcomes
CO1	Able to understand various queries and their execution
CO2	Populate and query a database using SQL DML/DDI commands.
CO3	Declare and enforce integrity constraints on a database
CO4	Programming PL/SQL including stored procedures, stored functions, cursors, packages
CO5	Able to design new database and modify existing ones for new applications and reason about the efficiency of the result

Task 1:	Used of CREATE, ALTER, RENAME, DROP, INSERT INTO, DELETE and UPDATE statement in the database tables (relations)
Task 2:	Use of simple select statement, select query on two relations, nesting of queries, aggregate functions, substring comparison & order by statement
Task 3:	Write a PL/SQL code to add two numbers and display the result. Read the numbers during run time.
Task 4:	Write a PL/SQL code to find sum of first 10 natural numbers using while and for loop.
Task 5:	Write a program to create a trigger which will convert the name of a student to upper case before inserting or updating the name column of student table.
Task 6:	Write a PL/SQL block to increase the salary of all doctors by 1000.
Task 7:	Write a PL/SQL code to multiply two numbers using procedure inside the block.
Task 8:	Design database for Student Management System for your college using E-R model and Normalization.
Task 9:	Design and Develop Conceptual Data Model (E-R Diagram) for Library Management System with all the necessary entities, attributes, constraints and relationships. Design and build Relational Data Model for application specifying all possible constraints.

Recommended Hardware & Software:

Intel Core i-3 / i-5 / i-7 processor with a speed of minimum 2 GHz, RAM 2 GB or higher, HDD 200 GB or higher, LED / LCD screen and Oracle/ Microsoft SQL Server/ MySQL/ Microsoft Access.

Text Books:

1. SQL, PL/SQL Programming Language of Oracle by 4th Revised Edition, Ivan Bayross.
2. Oracle PL/SQL Programming by 5th Edition, Steven Feuerstein and Bill Pribyl.

IK Gujral Punjab Technical University Jalandhar
B. Voc. (Networking & System Administration), Batch-2019

Course Code: **BVNS206-19**

Course Name: **Object Oriented Programming using C++ Laboratory**

Program: B. Voc.	L: 0 T: 0 P: 3
Branch: Networking & System Administration	Credits: 1.5
Semester: 1st	Percentage of numerical/design problems:-
Theory/Laboratory: Laboratory	Duration of end semester exam (ESE):-
Internal max. marks: 30	External max. marks: 20
Total marks: 50	Status (Elective/Core): Core

Course Outcomes:

CO#	Course outcomes
CO1	To learn programming from real world examples.
CO2	To understand Object oriented approach for finding Solutions to various problems with the help of C++ language.
CO3	To create computer based solutions to various real-world problems using C++ .
CO4	To learn various concepts of object oriented approach towards problem solving.

Task 1:	Write a program to enter mark of 6 different subjects and find out the total mark (Using cin and cout statement).
Task 2:	Write a function using reference variables as arguments to swap the values of pair of integers.
Task 3:	Write a function to find largest of three numbers.
Task 4:	Write a program to find the factorial of a number.
Task 5:	Define a class to represent a bank account which includes the following members as Data members: a) Name of the depositor b) Account Number c) Withdrawal amount d) Balance amount in the account Member Functions: a) To assign initial values b)To deposit an amount c) To withdraw an amount after checking the balance d) To display name and balance.
Task 6:	Write the above program for handling n number of account holders using array of objects.
Task 7:	Write a program for overloading of Unary ++ operator & Binary + operator.
Task 8:	Write a program of Virtual Functions & Abstract Class.
Task 9:	Write a program to read and write from file.

Recommended Hardware & Software:

Intel Core i-3 / i-5 / i-7 processor with a speed of minimum 2 GHz, RAM 2 GB or higher, HDD 200 GB or higher, LED / LCD screen and Oracle/ Microsoft SQL Server/ MySQL/ Microsoft Access.

Text Books:

1. Computer Networks, Tanenbaum, Andrew, Fifth Edition, PHI.
2. Data Communication and Networking, Behrouz A. Forouzan, Fourth Edition.
3. Computer Today, S.K. Basandra, First Edition, Galgotia.