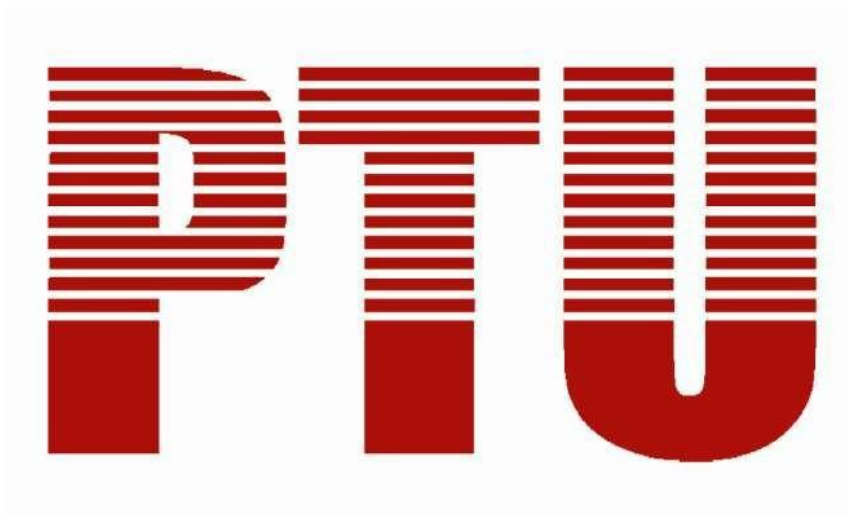


**Scheme & Syllabus of  
Bachelor of Vocational Studies  
(B. Voc.)  
Hardware & Networking  
Batch 2018**



By  
Department of Academics  
**IKG Punjab Technical University**

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

**Semester 1st**

Course Code	Course Title	Load Allocation		Marks Distribution		Total	Credits	
		L	P	Internal	External			
BVHN101-18	PC Hardware	3	0	40	60	100	3	
BVHN102-18	Computer Networking	3	0	40	60	100	3	
BVHN103-18	Communicative English	3	0	40	60	100	3	
BVHN104-18	Basic IT Skills	3	0	40	60	100	3	
BVHN105-18	PC Hardware Laboratory	0	3	30	20	50	1.5	
BVHN106-18	Computer Networking Laboratory	0	3	30	20	50	1.5	
<b>On-Job Training / Qualification Pack*</b>								
BVHN107-18	Service technician - >Senior Service Technician -> Service Supervisor	On Job Training (OJT) in Collaboration with MoU industry			200	200	200	15
Total		12	6	200	500	700	30	

\*The qualification packs may vary from institute to institute.

**Semester 2nd**

Course Code	Course Title	Load Allocation			Marks Distribution		Total	Credits
		L	T	P	Internal	External		
BVHN201-18	Database Management Systems	3	1	0	40	60	100	4
BVHN202-18	Programming in Java	3	1	0	40	60	100	4
BVHN203-18	Project Work-1	0	0	8	60	40	100	4
BVHN204-18	Database Management Systems Laboratory	0	0	3	30	20	50	1.5
BVHN205-18	Programming in Java Laboratory	0	0	3	30	20	50	1.5
<b>On-Job Training / Qualification Pack *</b>								
BVHN206-18	Android Apps Developer	On Job Training (OJT) in Collaboration with MoU industry			200	200	200	15
<b>Total</b>								<b>30</b>

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

**Semester 3rd**

Course Code	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BVHN301-18	Data warehousing and Mining	3	0	40	60	100	3
BVHN302-18	Problem Solving Using C	3	0	40	60	100	3
BVHN303-18	Human Values & Professional Ethics	3	0	40	60	100	3
BVHN304-18	Management information System	3	0	40	60	100	3
BVHN305-18	Problem Solving using C Laboratory	0	3	30	20	50	1.5
BVHN306-18	Workshop on Desktop Publishing Laboratory	0	3	30	20	50	1.5
<b>On-Job Training</b>							
BVHN307-18	Project Work-II				200	200	15
<b>Total</b>							<b>30</b>

**Semester 4th**

Course Code	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BVHN401-18	Information Security	3	0	40	60	100	3
BVHN402-18	Software Engineering	3	0	40	60	100	3
BVHN403-18	Object Oriented Programming using C++	3	0	40	60	100	3
BVHN404-18	Computer System Architecture	3	0	40	60	100	3
BVHN405-18	Computer System Architecture Laboratory	0	3	30	20	50	1.5
BVHN406-18	Object Oriented Programming using C++ Laboratory	0	3	30	20	50	1.5
<b>On-Job Training / Qualification Pack*</b>							
BVHN407-18	Networking Specialist	On Job Training (OJT) in Collaboration with MoU industry			200	200	15
<b>Total</b>							<b>30</b>

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

**Semester 5th**

Course Code	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Int	Ext		
BVHN501-18	Programming in Python	3	0	40	60	100	3
BVHN502-18	E-Commerce	3	0	40	60	100	3
BVHN503-18	Microprocessor and Microcontroller.	3	0	40	60	100	3
BVHN504-18	Cyber Security	3	0	40	60	100	3
BVHN505-18	Programming in Python Laboratory	0	3	30	20	50	1.5
BVHN506-18	Microprocessor and Microcontroller Laboratory	0	3	30	20	50	1.5
<b>On-Job Training / Qualification Pack*</b>							
BVHN507-18	<b>On Job Training (OJT) in Collaboration with MoU industry</b>				<b>200</b>	<b>200</b>	<b>15</b>
	<b>Total</b>						<b>30</b>

**Semester 6th**

Course Code	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Int	Ext		
BVHN601-18	Web Designing	3	0	40	60	100	3
BVHN602-18	Environment Science	3	0	40	60	100	3
BVHN603-18	Operating System	3	0	40	60	100	3
BVHN604-18	Computer Peripherals and Interfaces	3	0	40	60	100	3
BVHN605-18	Web Designing Laboratory	0	3	30	20	50	1.5
BVHN606-18	Operating System Laboratory	0	3	30	20	50	1.5
<b>On-Job Training / Qualification Pack*</b>							
BVHN607-18	<b>On Job Training (OJT) in Collaboration with MoU industry</b>				<b>200</b>	<b>200</b>	<b>15</b>
	<b>Total</b>						<b>30</b>

\*The qualification packs may vary from institute to institute.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN101-18**

Course Name: **PC Hardware**

Program: B.Voc	L:3 T:0 P:0
Branch: Hardware & Networking	Credits:3
Semester: I	Contact hours: 33
Theory/Laboratory: Theory	Elective status: core
Internal max. marks: 40	
External max. marks:60	
Total marks: 100	

<b>Detailed contents</b>	<b>Contact hours</b>
<p><b>Unit 1:</b>            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</p>	9
<p><b>Unit 2:</b>            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 &amp; replacement of motherboard, troubleshooting problems with memory.</p>	8
<p><b>Unit 3:</b>            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.</p>	8
<p><b>Unit 4:</b>            Diagnose and troubleshooting of microcomputer systems hardware &amp; 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.</p>	8

**Suggested Readings**

1. PC Hardware: The Complete Reference, McGraw-Hills
2. The Indispensable PC Hardware Book (4th Edition) Hans-Peter Messmer
3. PC Hardware: A Beginner's Guide by Ron Gilster

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN102-18**

Course Name: **Computer Networking**

Program: B.Voc	L:3 T:0 P:0
Branch: Hardware & Networking	Credits:3
Semester: I	Contact hours: 33
Theory/Laboratory: Theory	Elective status: core
Internal max. marks: 40	
External max. marks: 60	
Total marks: 100	

<b>Detailed contents</b>	<b>Contact hours</b>
<b>Unit 1 :</b> 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
<b>Unit 2 :</b> 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
<b>Unit 3 :</b> 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
<b>Unit 4 :</b> MAC sub layer: 802.4Token Bus, IEEE 802.5 Token Ring Concept of Internetworking.	8

**Suggested Readings**

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
4. Data Communication System, Black, Ulysse, Third Edition, PHI
5. Data and Computer Communications, Stalling, Ninth Edition, PHI

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN103-18**

Course Name: **Communication Skills**

Program: B.Voc	L:3 T:0 P:0
Branch: Hardware & Networking	Credits:3
Semester: I	Contact hours: 33
Theory/Laboratory: Theory	Elective status: core
Internal max. marks: 40	
External max. marks: 60	
Total marks: 100	

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

**Recommended Readings:**

1. Fluency in English - Part II, Oxford University Press, 2006.
2. Business English, Pearson, 2008.
3. Practical English Usage. Michael Swan. OUP. 1995.
4. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011.
5. Exercises in Spoken English

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN104-18**

Course Name: **Basic IT Skill**

Program: B.Voc	L:3 T:0 P:0
Branch: Hardware & Networking	Credits:3
Semester: I	Contact hours: 33
Theory/Laboratory: Theory	Elective status: core
Internal max. marks: 40	
External max. marks: 60	
Total marks: 100	

<b>Detailed contents</b>	<b>Contact hours</b>
<b>Unit 1 :</b> 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.	9
<b>Unit 2:</b> Concept of Computing & PC Software– I Concept of Computing. 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.	8
<b>Unit 3 :</b> PC Software – II 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.	8
<b>Unit 4 :</b> 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).	8

**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.
4. IT Tools, R.K. Jain, Khanna Publishing House
5. “Introduction to Information Technology”, Satish Jain, Ambrish Rai & Shashi Singh, Paperback Edition, BPB Publications, 2014.

**Reference Books:**

1. “Introduction to Computers”, Peter Norton
2. Computers Today, D. H. Sanders, McGraw Hill.
3. “Computers”, Larry long & Nancy long, Twelfth edition, Prentice Hall.
4. Problem Solving Cases in MicrosoftExcel, Joseph Brady & Ellen F Monk, Thomson Learning

**E Books/ Online learning material**

1. [www.sakshat.ac.in](http://www.sakshat.ac.in)
2. <https://swayam.gov.in/course/4067-computer-fundamentals>



**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN105-18**

Course Name: **PC Hardware Laboratory**

Program: B.Voc	L:0 T:0 P:3
Branch: Hardware & Networking	Credits:1.5
Semester: I	
Theory/Laboratory : <b>Laboratory</b>	Percentage of numerical/design problems:--
Internal max. marks: 30	Duration of end semester exam (ESE):--
External max. marks: 20	Elective status: core
Total marks: 50	

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.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN106-18**

Course Name: **Computer Networking Laboratory**

Program: B.Voc	L:0 T:0 P:3
Branch: Hardware & Networking	Credits:1.5
Semester: I	
Theory/Laboratory: <b>Laboratory</b>	Percentage of numerical/design problems:--
Internal max. marks: 30	Duration of end semester exam (ESE):--
External max. marks: 20	Elective status: core
Total marks: 50	

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

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code : **BVHN201-18**

Course Name : **DATABASE MANAGEMENT SYSTEMS**

Program : B.Voc	L:3 T:1 P:0
Branch : Hardware & Networking	Credits:4
Semester: 2 <sup>nd</sup>	Contact hours: 44
Theory/Laboratory : Theory	Elective status: 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
<b>Unit-I</b> 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 and Relational Model, Entity Relationship Model.	11
<b>Unit-II</b> Relational Database, Relational Algebra and Calculus, SQL Fundamentals, DDL, DML, DCL, PL/SQL Concepts, Cursors, Stored Procedures, Stored Functions, Database Triggers.	11
<b>Unit-III</b> 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).	11
<b>Unit-IV</b> Database Recovery, Concurrency Management, Database Security, Integrity and Control. Structure of a Distributed Database, Design of Distributed Databases.	11

**Text Books:**

1. "An Introduction to Database System", Bipin C. Desai, Galgotia Publications Pvt Ltd-New Delhi, Revised Edition, (2012).
2. "An Introduction to Database Systems", 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", Abraham Silberschatz, Henry F. Korth, S. Sudharshan, Tata McGraw Hill, 6th Edition, (2013).
3. Database Management Systems, Raghu Ramakrishnan, McGraw-Hill, Third Edition, 2014.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code : **BVHN202-18**

Course Name : **Programming in Java**

Program : B.Voc	L:3 T:1 P:0
Branch : Hardware & Networking	Credits:4
Semester: 2 <sup>nd</sup>	Contact hours: 44
Theory/Laboratory : Theory	Elective status: core
Internal max. marks: 40	
External max. marks:60	
Total marks: 100	

**Course Outcomes:**

CO#	Course outcomes
CO1	Familiarization with the concept of Object Oriented concepts by implementing Java Programming.
CO2	Learn the concepts of classes & objects with the features of reusability and implementation of the same with various control structures to solve real world problems.
CO3	Understand and design built-in and user defined functions/methods, interfaces and packages etc.
CO4	Able to handle various types of data using arrays & strings and handling of exceptions occurred in programs.
CO5	Utilize multithreading and applet features of Java for efficient and effective programming.
CO6	Create and handle files in Java.

Detailed Contents	Contact hours
<p><b>Unit-I</b></p> <p><b>Java Programming Fundamentals:</b> Introduction to Java, Stage for Java, Origin, Challenges of Java, Java Features, Java Program Development, Object Oriented Programming.</p> <p><b>Java Essentials:</b> Elements of Java Program, Java API, Variables and Literals, Primitive Data Types, The String class, Variables, Constants, Operators, Scope of Variables &amp; Blocks, Types of Comment in Java.</p>	11
<p><b>Unit-II</b></p> <p><b>Control Statements:</b> Decision making statements (if, if-else, nested if, else if ladder, switch, conditional operator), Looping statements (while, do-while, for, nested loops), Jumping statements (Break and Continue).</p> <p><b>Classes and Objects:</b> Basic concepts of OOPS, Classes and Objects, Modifiers, Passing arguments, Constructors, Overloaded Constructors, Overloaded Operators, Static Class Members, Garbage Collection.</p> <p><b>Inheritance:</b> Basics of inheritance, Inheriting and Overriding Superclass methods, Calling Superclass Constructor, Polymorphism, Abstract Classes, Final Class.</p>	11

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<p><b>Unit-III</b></p> <p><b>Arrays and Strings:</b> Introduction to array, Processing Array Contents, Passing array as argument, Returning array from methods, Array of objects, 2D arrays, Array with three or more dimensions. String class, string concatenation, Comparing strings, Substring, Difference between String and String Buffer class, String Tokenizer class.</p> <p><b>Interface and Packages:</b> Basics of interface, Multiple Interfaces, Multiple Inheritance Using Interface, Multilevel Interface, Packages, Create and Access Packages, Static Import and Package Class, Access Specifiers.</p> <p><b>Exception Handling:</b> Introduction, Try and Catch Blocks, Multiple Catch, Nested Try, Finally, Throw Statement, Built-In Exceptions.</p>	11
<p><b>Unit-IV</b></p> <p><b>Multithreading:</b> Introduction, Threads in Java, Thread Creation, Lifecycle of Thread, Joining a Thread, Thread Scheduler, Thread Priority, Thread Synchronization.</p> <p><b>Applets:</b> Introduction, Applet Class, Applet Life Cycle, Graphics in Applet, Event-Handling.</p> <p><b>File and I/O Streams:</b> File Class, Streams, Byte Streams, Filtered Byte Streams, Random Access File Class, Character Streams.</p>	11

**Text Books:**

1. Programming with Java A Primer, 5<sup>th</sup> Edition, E. Balagurusamy, TMH.
2. Java Programming for Core and Advanced Learners, Sagayaraja, Denis, Karthik, Gajalakshmi, Universities Press.
3. Java Fundamentals, A Comprehensive Introduction, H. Schildt, D. Skrien, TMH.

**Reference Books:**

1. Java, The complete Reference, H. Schildt, 7<sup>th</sup> Edition, TMH.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN203-18**

Course Name: **Project - 1**

Program: B.Voc	L:0 T:0 P:8
Branch: Hardware & Networking	Credits:4
Semester: 2 <sup>nd</sup>	
Theory/Laboratory: <b>Laboratory</b>	Percentage of numerical/design problems: --
Internal max. marks: 60	Duration of end semester exam (ESE):--
External max. marks:40	Elective status: core/ <del>elective</del>
Total marks: 100	

Starting of Major Project named as Minor Project (Feasibility Study, Requirement Analysis and Design)

**Tools for Minor Projects**

Frontend                      Java  
Backend                      Sql Server or Oracle or MS Access

In Minor Projects 2 normal applications and one database related application is must

**Note: The breakup of marks for the External practical will be as under**

Viva Voce                      15 marks  
System Development      25 marks

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN204-18**

Course Name: **Database Management Systems Laboratory**

Program: B.Voc	L:0 T:0 P:3
Branch: Hardware & Networking	Credits:1.5
Semester: 2 <sup>nd</sup>	
Theory/Laboratory: Laboratory	Percentage of numerical/design problems: --
Internal max. marks: 30	Duration of end semester exam (ESE):--
External max. marks:20	Elective status: core/ <del>elective</del>
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/DDL 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

**Instructions:**

1.	Used of CREATE, ALTER, RENAME and DROP statement in the database tables (relations)
2.	Used of INSERT INTO, DELETE and UPDATE statement in the database tables (relations)
3.	Use of simple select statement.
4.	Use of select query on two relations
5.	Use of nesting of queries.
6.	Use of aggregate functions.
7.	Use of substring comparison.
8.	Use of order by statement.
9.	<p>Consider the following schema for a Library Database:</p> <p>BOOK (<i>Book_id, Title, Publisher_Name, Pub_Year</i>)</p> <p>BOOK_AUTHORS (<i>Book_id, Author_Name</i>)</p> <p>PUBLISHER (<i>Name, Address, Phone</i>)</p> <p>BOOK_COPIES (<i>Book_id, Branch_id, No-of_Copies</i>)</p> <p>BOOK_LENDING (<i>Book_id, Branch_id, Card_No, Date_Out, Due_Date</i>)</p> <p>LIBRARY_BRANCH (<i>Branch_id, Branch_Name, Address</i>)</p> <p>Write SQL queries to</p> <ol style="list-style-type: none"> <li>Retrieve details of all books in the library_id, title, name of publisher, authors, number of copies in each branch, etc.</li> <li>Get the particulars of borrowers who have borrowed more than 3 books between Jan 2018 to Jun 2018</li> <li>Delete a book in BOOK table. Update the contents of other tables to reflect this data</li> </ol>

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

	<p>manipulation operation.</p> <p>4. Partition the BOOK table based on year of publication. Demonstrate its working with a simple query.</p> <p>5. Create a view of all books and its number of copies that are currently available in the Library.</p>
10.	<p>Consider the following schema for Order Database:</p> <p>SALESMAN (<i>Salesman_id, Name, City, Commission</i>)</p> <p>CUSTOMER (<i>Customer_id, Cust_Name, City, Grade, Salesman_id</i>)</p> <p>ORDERS (<i>Ord_No, Purchase_Amt, Ord_Date, Customer_id, Salesman_id</i>)</p> <p>Write SQL queries to</p> <ol style="list-style-type: none"> <li>Count the customers with grades above Amritsar's average.</li> <li>Find the name and numbers of all salesmen who had more than one customer.</li> <li>List all salesmen and indicate those who have and don't have customers in their cities (Use UNION operation.)</li> <li>Create a view that finds the salesman who has the customer with the highest order of a day.</li> <li>Demonstrate the DELETE operation by removing salesman with id 1000. All his orders must also be deleted.</li> </ol>
11.	Write a PL/SQL code to add two numbers and display the result. Read the numbers during run time.
12.	Write a PL/SQL code to find sum of first 10 natural numbers using while and for loop.
13.	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.
14.	Write a PL/SQL block to count the number of rows affected by an update statement using SQL%ROWCOUNT
15.	Write a PL/SQL block to increase the salary of all doctors by 1000.
16.	Write a PL/SQL code to multiply two numbers using procedure inside the block.
17.	Write a PL/SQL code to calculate factorial of a given number using function.
18.	Create a package that contains function and procedure.
19.	Design database for Student Management System for your college using E-R model and Normalization.
20.	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.

**Reference Books:**

1. "SQL, PL/SQL The Programming Language of Oracle", 4th Revised Edition, Ivan Bayross (2009).
2. "Oracle PL/SQL Programming", 5th Edition, Steven Feuerstein and Bill Pribyl (2009).



**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN205-18**

Course Name: **Programming in Java Laboratory**

Program: B.Voc	L:0 T:0 P:3
Branch: Hardware & Networking	<b>Credits:1.5</b>
Semester: 2 <sup>nd</sup>	<b>Contact hours:</b>
Theory/Laboratory: <b>Laboratory</b>	Percentage of numerical/design problems: --
Internal max. marks: 30	Duration of end semester exam (ESE):--
External max. marks:20	Elective status: core/ <del>elective</del>
Total marks: 50	

**Course Outcomes:** Will nurture the programming skills of the students. Students will be able to develop interest in designing projects/software.

CO#	Course Outcomes
CO1	Implement Core Java concepts.
CO2	Solve computational problems using various operators of Java.
CO3	Design solutions to complex by handling exceptions that may occur in the programs.
CO4	Solve complex and large problems using the concept of multithreading.
CO5	Implement interfaces and design packages.

**Instructions:** All programs are to be developed in Java programming language.

1.	Write a program to perform following operations on two numbers input by the user: 1) Addition 2) subtraction 3) multiplication 4) division
2.	Write a Java program to print result of the following operations. 1. $-15 + 58 * 45$ 2. $(35+8) \% 6$ 3. $24 + -5*3 / 7$ 4. $15 + 18 / 3 * 2 - 9 \% 3$
3.	Write a Java program to compute area of: 1) Circle 2) rectangle 3) triangle 4) square
4.	Write a program to convert temperature from Fahrenheit to Celsius degree using Java.
5.	Write a program through Java that reads a number in inches, converts it to meters.
6.	Write a program to convert minutes into a number of years and days.
7.	Write a Java program that prints current time in GMT.
8.	Design a program in Java to solve quadratic equations using if, if else
9.	Write a Java program to determine greatest number of three numbers.
10.	Write program that gets a number from the user and generates an integer between 1 and 7 subsequently should display the name of the weekday as per that number.
11.	Construct a Java program to find the number of days in a month.
12.	Write a program to sum values of an Single Dimensional array.
13.	Design & execute a program in Java to sort a numeric array and a string array.
14.	Calculate the average value of array elements through Java Program.
15.	Write a Java program to test if an array contains a specific value.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

16.	Find the index of an array element by writing a program in Java.
17.	Write a Java program to remove a specific element from an array.
18.	Design a program to copy an array by iterating the array.
19.	Write a Java program to insert an element (on a specific position) into Multidimensional array.
20.	Write a program to perform following operations on strings: 1) Compare two strings. 2) Count string length. 3) Convert upper case to lower case & vice versa. 4) Concatenate two strings. 5) Print a substring.
21.	Developed Program & design a method to find the smallest number among three numbers.
22.	Compute the average of three numbers through a Java Program.
23.	Write a Program & design a method to count all vowels in a string.
24.	Write a Java method to count all words in a string.
25.	Write a method in Java program to count all words in a string.
26.	Write a Java program to handle following exceptions: 1) Divide by Zero Exception. 2) Array Index Out Of B bound Exception.
27.	To represent the concept of <i>Multithreading</i> write a Java program.
28.	To represent the concept of all types of inheritance supported by Java, design a program.
29.	Write a program to implement <i>Multiple Inheritance</i> using interface.
30.	Construct a program to design a package in Java.
31.	To write and read a plain text file, write a Java program.
32.	Write a Java program to append text to an existing file.
33.	Design a program in Java to get a list of all file/directory names from the given.
34.	Develop a Java program to check if a file or directory specified by pathname exists or not.
35.	Write a Java program to check if a file or directory has read and write permission.

**Text Books:**

1. Programming with Java A Primer, 5<sup>th</sup> Edition, E. Balagurusamy, TMH.
2. Java Programming for Core and Advanced Learners, Sagayaraja, Denis, Karthik, Gajalakshmi, Universities Press.
3. Java Fundamentals, A Comprehensive Introduction, H. Schildt, D. Skrien, TMH.

**Reference Books:**

1. Java, The complete Reference, H. Schildt, 7<sup>th</sup> Edition, TMH.
2. Data Analytics using R, Seema Acharya, TMH.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN301-18**

Course Name: **Data warehousing and Mining**

Program: B.Voc	L:3 T:0 P:0
Branch: Hardware & Networking	Credits:3
Semester : III	Contact hours: 33
Theory/Laboratory: Theory	Elective status: core
Internal max. marks: 40	
External max. marks: 60	
Total marks: 100	

<b>Detailed contents</b>	<b>Contact hours</b>
<b>Unit 1:</b> Introduction to Data Warehousing, The need for data warehousing, Operational & Informational Data Stores, Data Warehouse Characteristics, Data Warehouse role & Structure, The cost of warehousing data. Introduction to OLAP &OLTP, Difference between OLAP &OLTP. OLAP Operations	9
<b>Unit 2:</b> Building a Data Warehouse, Design/Technical/Implementation Considerations, and Data Pre- processing Overview. Data Summarization, Data Cleaning, Data Transformation, Concept Hierarchy, Structure. Patterns & Models, Artificial Intelligence (Overview). Multidimensional Data Model, Schemas for Multidimensional Data (Star Schema, Snowflake Schema, Fact Constellation), Data Warehouse Architecture, Data Warehouse Design OLAP Three-tier Architecture.	8
<b>Unit 3:</b> Association Rule Mining, Market Basket Analysis, Apriori Algorithm, Mining Multi level Association Rules, Introduction to Classification, Classification by decision Tree, Attribute Selection Measure.	8
<b>Unit 4:</b> Introduction to Prediction techniques, Accuracy of a Classifier, Cross-Validation, Bootstrap, Boosting, Bagging, Introduction to Clustering, Classification of Various Clustering Algorithms, Data Visualization.	8

### **Suggested Readings**

1. Data Warehousing, Data Mining, and OLAP, Alex Berson, First Edition, Tata Mc Graw Hill
2. Data Mining Concepts & Techniques, Jiawei Han & Micheline Kamber, Second Edition, Morgan Kaufmann Publishers
3. Modern Data Warehousing, Mining & Visualization Core Concepts, George M Marakas, First Edition, Pearson Education
4. Data Warehousing, Architecture & Implementation, Hawkin, Prentice Hall
5. Data Mining: Modeling Data for Marketing, Risk and Customer Relationship Mgmt, Rud, Olivia, Paperback Edition.
6. Data Mining Techniques, Berry, Michael, Third Edition
7. Data Mining, Data Warehousing and OLAP, Sharma, Gajendra, Second Edition
8. Data Mining with Case Studies, Gupta GK, Second Edition
9. Principles of Data Mining, Hand, David.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN302-18**

Course Name: **Problem Solving using C**

Program : B. Voc	L:3 T:0 P:0
Branch : Hardware & Networking	Credits:3
Semester: III	Contact hours: 33
Theory/Laboratory : Theory	Elective status: core
Internal max. marks: 40	
External max. marks:60	
Total marks:100	

Detailed contents	Contact hours
<b>Unit 1:</b> <b>Logic Development:</b> Flowcharts and algorithms. Fundamentals: Character set, Identifiers and Key Words, Data types, Constants, Variables, Expressions, Statements, Symbolic Constants. <b>Operations and Expressions:</b> Arithmetic operators, Unary operators, Relational Operators, Logical Operators, Assignment and Conditional Operators, Library functions.	8
<b>Unit 2:</b> <b>Control Statements:</b> While, Do-while and For statements, Nested loops, If-else, Switch, Break – Continue statements.	8
<b>Unit 3:</b> <b>Functions:</b> defining Function, accessing functions, passing arguments to function, specifying argument data types, function prototypes <b>Arrays:</b> Defining, processing arrays, passing arrays to a function, multi-dimensional arrays.	8
<b>Unit 4:</b> <b>Structures &amp; Unions:</b> Defining and processing a structure, user defined data types, structures and pointers, passing structures to functions, unions. <b>Pointers:</b> Introduction to Pointers	9

**Text Books:**

1. Programming in ANSI C, E. Balagurusami, Fourth Edition, Tata McGraw Hill.
2. Programming in C, Third Edition, Stephen G Kochan, Pearson.
3. The C Programming Language, Kernighan & Richie, Second Edition, PHI Publication.

**Reference Books:**

1. Object Oriented Programming, Lafore R, Third Edition, Galgotia Publications
2. Let us C, Yashvant P Kanetkar, Seventh Edition, BPB Publications, New Delhi.
3. Programming in C, Byron S. Gottfried, Second Edition, McGraw Hills.
4. Problem Solving and Programming in C, R.S. Salaria, Second Edition
5. Programming in C, Atul Kahate.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code : **BVHN 303-18**

Course Name : **Human Values & Professional Ethics**

Program: Hardware and Networking	L:3 T:0 P: 0
Branch: B.Voc	Credits: 3
Semester: III	Contact hours:33
Theory/Laboratory: Theory	Elective status: core
Internal max. marks : 40	
External max. marks : 60	
Total marks: 100	

Detailed contents	Contact hours
<p><b>Unit- 1</b>            Course Introduction - Need, Basic Guidelines, Content and Process for Value Education</p> <ol style="list-style-type: none"> <li>1. Understanding the need, basic guidelines, content and process for Value Education</li> <li>2. Self – Exploration – what is it? its content and process; ‘Natural Acceptance’ and Experiential Validation as the mechanism for self exploration</li> <li>3. Continuous Happiness and Prosperity - A look at basic Human Aspirations</li> <li>4. Right understanding, Relationship and Physical Facilities - the basic requirements for fulfillment of aspirations of every human being with their correct priority</li> <li>5. Understanding Happiness and Prosperity correctly - A critical appraisal of the current scenario</li> <li>6. Method to fulfill the above human aspirations: understanding and living in harmony at various levels</li> </ol>	9
<p><b>Unit- 2</b>            Understanding Harmony in the Human Being - Harmony in Myself!</p> <ol style="list-style-type: none"> <li>1. Understanding human being as a co - existence of the sentient ‘I’ and the material ‘Body’</li> <li>2. Understanding the needs of Self (‘I’) and ‘Body’ - Sukh and Suvidha</li> <li>3. Understanding the Body as an instrument of ‘I’ (I being the doer, seer and enjoyer)</li> <li>4. Understanding the characteristics and activities of ‘I’ and harmony in ‘I’</li> <li>5. Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail</li> <li>6. Programs to ensure Sanyam and Swasthya - Practice Exercises and Case Studies will be taken up in Practice Sessions.</li> </ol>	8
<p><b>Unit-3</b>            Understanding Harmony in the Family and Society - Harmony in Human - Human Relationship</p> <ol style="list-style-type: none"> <li>1. Understanding harmony in the Family - the basic unit of human interaction</li> <li>2. Understanding values in human - human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay - tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.</li> <li>3. Understanding the meaning of Vishwas; Difference between intention and competence</li> <li>4. Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship.</li> <li>5. Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah - astitva as comprehensive Human Goals</li> <li>6. Visualizing a universal harmonious order in society - Undivided Society (Akhand Samaj), Universal Order (Sarvabhaum Vyawastha) - from family to world family! - Practice Exercises and Case Studies will be taken up in Practice Sessions.</li> </ol>	8

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<p><b>Unit-4</b>          Understanding Harmony in the Nature and Existence - Whole existence as Co -existence</p> <ol style="list-style-type: none"> <li>1. Understanding the harmony in the Nature</li> <li>2. Interconnectedness and mutual fulfillment among the four orders of nature              recyclability and self - regulation in nature</li> <li>3. Understanding Existence as Co-existence (Sah - astitva) of mutually interacting units              in all - pervasive space</li> <li>4. Holistic perception of harmony at all levels of existence - Practice Exercises and Case              Studies will be taken up in Practice Sessions.</li> </ol>	8
<p>Implications of the above Holistic Understanding of Harmony on Professional Ethics</p> <ol style="list-style-type: none"> <li>1. Natural acceptance of human values.</li> <li>2. Definitiveness of Ethical Human Conduct</li> <li>3. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal              Order</li> <li>4. Competence in professional ethics:             <ol style="list-style-type: none"> <li>a) Ability to utilize the professional competence for augmenting universal human                  order,</li> <li>b) Ability to identify the scope and characteristics of people - friendly and eco -                  friendly production systems,</li> <li>c) Ability to identify and develop appropriate technologies and management patterns                  for above production systems.</li> </ol> </li> <li>5. Case studies of typical holistic technologies, management models and production              systems</li> <li>6. Strategy for transition from the present state to Universal Human Order:             <ol style="list-style-type: none"> <li>a) At the level of individual: as socially and ecologically responsible engineers,                  technologists and managers</li> <li>b) At the level of society: as mutually enriching institutions and organizations</li> </ol> </li> </ol>	

**Text Book**

1. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Value Education.

**Reference Books**

1. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and Harper Collins, USA.
2. E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond &  
 Briggs, Britain.
3. A Nagraj, 1998, Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
4. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991.
5. PL Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.
6. A.N. Tripathy, 2003, Human Values, New Age International Publishers.
7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen (Vaidik) Krishi Tantra Shodh,  
 Amravati.
8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits  
 to Growth – Club of Rome’s report, Universe Books.
9. E G Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford  
 University Press
10. M Govindrajran, S Natrajan & V.S. Senthil Kumar, Engineering Ethics (including Human  
 Values), Eastern Economy Edition, Prentice Hall of India Ltd.
11. B P Banerjee, 2005, Foundations of Ethics and Management, Excel Books.
12. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow.  
 Reprinted 2008.

**Relevant CDs, Movies, Documentaries & Other Literature:**

1. Value Education website, <http://uhv.ac.in>
2. Story of Stuff, <http://www.storyofstuff.com>
3. Al Gore, An Inconvenient Truth, Paramount Classics, USA
4. Charlie Chaplin, Modern Times, United Artists, USA
5. IIT Delhi, Modern Technology – the Untold Story

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code : **BVHN304-18**

Course Name : **Management information System**

Program: B.Voc	L: 3 T: 0 P: 0
Branch: Hardware & Networking	Credits:3
Semester : III	Contact hours: 33
Theory/Laboratory : Theory	Elective status: core/elective
Internal max. marks: 40	
External max. marks:60	
Total marks:100	

<b>Detailed contents</b>	<b>Contact hours</b>
<b>Unit 1:</b> Introduction to Systems and Basic Systems Concepts, Elements (Components) of System, Characteristics of System, Types of Systems, System Approach. Information Systems: Definition& Characteristics, Types of Information, Role of Information in Decision-Making, Levels of Management Introduction to different kinds of Information Systems: ESS, EIS, DSS, MIS, KWS, TPS, OAS and EDP.	9
<b>Unit 2:</b> An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Robert Anthony's Hierarchy of Management Activity, Structured Vs Unstructured Decisions, Formal Vs. Informal Systems, Pitfalls in MIS Development.	8
<b>Unit 3:</b> Simon's Model of Decision Making. DSS: Concept, Characteristics and Components, Gorry & Scott Morton Grid, Introduction to GDSS. Developing Information Systems: Analysis & Design of Information Systems: Implementation & Evaluation.	8
<b>Unit 4:</b> Functional MIS: A Study of Marketing, Personnel, Financial and Production MIS.	8

**Suggested Books:**

1. Management Information Systems, Goyal, D.P., Third Edition, Macmillan.
2. Management Information Systems, Oz, Effy, Thomson Press Indian Edition.
3. "Management Information Systems", Kanter, J.,Third Edition, PHI.
4. "Management Information Systems", Davis, Gordan B.&Olson, M.H, Second Edition
5. "Information Systems for Modern Management", Murdick, RobertG., &Ross, JoelE., & Claggett, James R., Third Edition, PHI.
6. "Analysis, Design & Implementation of Information System", Lucas, Fourth Edition
7. Management Information Systems, Laudon K.C., Eleventh Edition, Pearson

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN 305-18**

Course Name: **Problem Solving using C Laboratory**

Program: B.Voc	L:0 T:0 P:3
Branch: Hardware & Networking	Credits:1.5
Semester: III	
Theory/Laboratory: <b>Laboratory</b>	Percentage of numerical/design problems: --
Internal max. marks: <b>30</b>	Duration of end semester exam (ESE):--
External max. marks: <b>20</b>	Elective status: core/ <del>elective</del>
Total marks: <b>50</b>	

**Instructions: Develop all programs in C programming language.**

<b>1</b>	WRITE A PROGRAM to display your name. Write another program to print message with inputted name.
<b>2</b>	WRITE A PROGRAM to add two numbers.
<b>3</b>	WRITE A PROGRAM to find the square of a given number.
<b>4</b>	WRITE A PROGRAM to calculate the average of three real numbers.
<b>5</b>	WRITE A PROGRAM to create a table.
<b>6</b>	WRITE A PROGRAM to print even or odd number.
<b>7</b>	WRITE A PROGRAM to Compute Quotient and Remainder
<b>8</b>	WRITE A PROGRAM to accept the values of two variables.
<b>9</b>	WRITE A PROGRAM to find the simple interest, inputs are amount, period in years and rate of interest.
<b>10</b>	WRITE A PROGRAM to use increment/ decrement operators.
<b>11</b>	WRITE A PROGRAM to find area of a circle.
<b>12</b>	WRITE A PROGRAM to find volume of a cube using side as input from user
<b>13</b>	WRITE A PROGRAM to swap numbers.

**Reference Books:**

1. Object Oriented Programming, Lafore R, Third Edition, Galgotia Publications
2. Let us C, Yashvant P Kanetkar, Seventh Edition, BPB Publications, New Delhi.
3. Programming in C, Byron S. Gottfried, Second Edition, McGraw Hills.
4. Problem Solving and Programming in C, R.S. Salaria, Second Edition
5. Programming in C, Atul Kahate.



**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN306-18**

Course Name: **Workshop on Desktop Publishing Laboratory**

Program: B.Voc	L:0 T:0 P:3
Branch: Hardware & Networking	Credits:1.5
Semester: III	
Theory/Laboratory: <b>Laboratory</b>	Percentage of numerical/design problems: --
Internal max. marks: 30	Duration of end semester exam (ESE):--
External max. marks:20	Elective status: core/ <del>elective</del>
Total marks: 50	

**Instructions:** Instructor can increase/decrease the experiments as per the requirement.

**Assignments:**

1	Design and print a Title Page of a Magazine/Book.
2	Prepare multiple designs for a Flex by using different Tools.
3	Prepare NSS Certificates for appreciation using logos of University, College & NSS unit.
4	Prepare 5 different Designing of Business Cards.
5	Prepare Envelops displaying full address of the company by inserting graphical symbol/ logos of company.
6	Design and Print Invoices for three companies.
7	Prepare and print News Letter Layouts for any five activities of your college/ university.
8	Prepare Invitation Cards for cultural meet held in your college
9	Design and print Brochures to advertise a “Blood Donation Camp” in your college.
10	Design Logos of your college, University & Govt. of Punjab also display these logos on black background as water mark.
11	Design, Print and Publish 5 motivations Playcards.
12	Design & Print assignment book of minimum 20 Pages an any Topic.
13	Design & Print any five most important activities of your college in a collage.
14	Design & Print Question Paper of any Subject.
15	Assemble all the latest news cutting of your activities on a 10 X 8 size flex.

**Reference Books:**

1. DTP Course, by Shirish Chavan published by Rapidex.
2. DTP Course Kit by Vikas Gupta published by Comdex.
3. CorelDraw 9 by David Karlins published by Techmedia.
4. Adobe Illustrator CC by Brian Wood published by Adobe Press.
5. Page Maker in Easy Steps - Scott Basham.

**Software Tools:**

1. Adobe Illustrator 14.
2. CorelDraw Graphics Suit.
3. GNU image manipulation program.
4. Ink Scape.
5. PhotoScape Setup.
6. PM701.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code : **BVHN 401-18**

Course Name : **Information Security**

Program : B.Voc	L:3 T:0 P:0
Branch : Hardware & Networking	Credits:3
Semester: IV	Contact hours: 33
Theory/Laboratory : Theory	Elective status: core
Internal max. marks: 40	
External max. marks:60	
Total marks: 100	

<b>Detailed contents</b>	<b>Contact hours</b>
<b>Unit 1</b> : Information Security Concepts : Information Security Overview: Background and Current Scenario, Principles of Security- Information Classification, Policy Framework, Role based Security in an organization, Components of Information Systems, Balancing Information Security and Access, Approaches to information Security Implementation, Security Systems Development Life Cycle.	9
<b>Unit 2</b> : Security Threats and Vulnerabilities: Overview of Threats and Vulnerabilities-Intruders, Malicious Software, Viruses and related Threats, Desktop Security, Email security: PGP and S/MIME, Web Security: Web authentication, SSL and SET, Database Security. Firewalls- Overview, Design principles and Types.	8
<b>Unit 3</b> : Security Management and Laws: Introduction to Security Management, Access Control and Intrusion Detection, Overview of Identification and Authorization, Intrusion Detection Systems And Intrusion Prevention Systems, Security Procedures and Guidelines, Business Ethics and Best Practices, Security Assurance, Security Laws, IPR, International Security Standards, Security Audit, SSE-CMM/COBIT etc.	8
<b>Unit 4</b> : Cryptography: Concepts and Techniques, Symmetric and Asymmetric Key Cryptography, Steganography, Symmetric Key Ciphers-DES, AES (Structure and Analysis). Asymmetric Key Ciphers- Principles of Public Key cryptosystems, RSA Algorithm and its Analysis. Digital Signatures.	8

**Suggested Books:**

- 1) Introduction to Information Security and Cyber Laws Paperback-by Surya Prakash Tripathi (Author), Ritendra Goel (Author), Praveen Kumar Shukla (Author)
- 2) Principles of Information Security. Paperback-by Whitman (Author)
- 3) Cryptography and Information Security Paperback-by Pachghare V.K. (Author)

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN 402-18**

Course Name: **Software Engineering**

Program : B.Voc	L:3 T:0 P:0
Branch : Hardware & Networking	Credits:3
Semester: IV	Contact hours: 33
Theory/Laboratory : Theory	Elective status: core
Internal max. marks: 40	
External max. marks:60	
Total marks: 100	

<b>Detailed contents</b>	<b>Contact hours</b>
<b>Unit 1 :</b> Software:Characteristics,ComponentsApplications,SoftwareProcessModels:Waterfall, Spiral, Prototyping, Fourth Generation Techniques, Concepts of Project Management, Role Of Metrics And Measurement.	9
<b>Unit 2 :</b> S/W Project Planning: Objectives, Decomposition Techniques: S/W Sizing, Problem Based Estimation, Process Based Estimation, Cost Estimation Models: COCOMO Model, The S/W Equation, System Analysis: Principles Of Structured Analysis, Requirement Analysis, DFD, Entity Relationship Diagram, Data Dictionary. S/W Design: Objectives, Principles, Concepts, And Design Methodologies: Data Design, Architecture Design, Procedural Design, Object – Oriented Concepts.	8
<b>Unit 3 :</b> Testing Fundamentals: Objectives, Principles, Testability, Test Case Design: White Box & Black Box testing, Testing Strategies: Verification & Validation, Unit Testing, Integration Testing, Validation Testing, System Testing.	8
<b>Unit 4 :</b> Advanced topics in Software Engineering: Reengineering: Reverse Engineering, Restructuring, Forward Engineering. Computer Aided Software Engineering (CASE):Taxonomy of CASE tools.	8

**Suggested Books:**

1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach", Sixth Edition, McGraw Hill
2. R.E. Fairley, "Software Engineering Concepts", Paperback Edition, McGraw Hill.
3. Jalota, "An Integrated Approach to Software Engineering", Third Edition, Narosa Publishing House

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN403-18**

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

Program: B.Voc	L:3 T:0 P:0
Branch: Hardware & Networking	Credits:3
Semester: IV	Contact hours: 33
Theory/Laboratory: Theory	Elective status: core
Internal max. marks: 60	
External max. marks:40	
Total marks: 100	

<b>Detailed contents</b>	<b>Contact hours</b>
<b>Unit 1: Principles of object oriented programming</b> 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
<b>Unit 2: Classes &amp; Objects and Concept of Constructors</b> 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 and destructors	8
<b>Unit 3 : Inheritance</b> Introduction to Inheritance, Types of inheritance: - Single inheritance, Multiple inheritance, Multilevel inheritance, Hierarchical inheritance, Hybrid inheritance	8
<b>Unit 4:File Handling</b> Introduction to file, Opening and Closing File, various I/O functions used in file handling.	8

**Suggested Books:**

1. Object Oriented Programming with C++, E. Balagurusami, Fourth Edition, Tata Mc-Graw Hill.
2. Object Oriented Programming in Turbo C++, Robert Lafore, Fourth Edition Galgotia Publications.
3. The C++ Programming Language, Bjarna Stroustrup, Third Edition, AddisonWesley Publishing Company.
4. Object Oriented Programming Using C++, Salaria, R. S, Fourth Edition, Khanna Book Publishing

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN404-18**

Course Name: **Computer System Architecture**

Program: B.Voc	L:3 T:0 P:0
Branch: Hardware & Networking	Credits:3
Semester: IV	Contact hours: 33
Theory/Laboratory: <b>Laboratory</b>	Elective status: core
Internal max. marks: 30	
External max. marks:20	
Total marks: 50	

<b>Detailed contents</b>	<b>Contact hours</b>
<p><b>Unit 1 : Logic Gates:</b> AND, OR, NOT, NAND, NOR, XOR, XNOR, NAND &amp; NOR as Universal Gates, Logic Gates Applications.</p> <p><b>Boolean Algebra:</b> Introduction, Theorems, Simplification of Boolean Expression using Boolean Algebra, SOP &amp; POS Forms, Realization of Boolean Expression using Gates, K-Maps, Simplification of Boolean Expression using K-Maps.</p>	9
<p><b>Unit 2 : Combinational Logic Circuits:</b> Half Adder &amp; Half Subtractor, Full Adder &amp; Full Subtractor, Parallel Binary Adder, Binary Adder/Subtractor.</p> <p><b>Combinational Logic Circuits:</b> Multiplexers &amp; Demultiplexers, Implementation of Boolean equations using Multiplexer and Demultiplexer, Encoders &amp; Decoders.</p>	8
<p><b>Unit 3: Sequential Logic Circuits:</b> Latch, Flip Flops- R-S Flip-Flop, J-K Flip-Flop, Race Around Condition, Master-Slave JK Flip-Flop, D Flip-Flop, T Flip-Flop, Applications of Flip-Flops.</p>	8
<p><b>Unit 4 : Introduction to Computer Organization:</b> Introduction to Computer and CPU (Computer Organization, Computer Design and Computer Architecture), Stored Program Concept- Von Neumann Architecture, RISC and CISC Architecture.</p> <p><b>Register Transfer and Micro operations-</b> Introduction to Registers, Instruction Format, Types of Instructions- Memory Reference Instructions, Register Reference Instructions and Input-Output Instructions.</p> <p><b>Common Bus System:</b> 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.</p>	8

**Suggested 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.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN 405-18**

Course Name: **Computer System Architecture Laboratory**

Program: B.Voc	L:0 T:0 P:3
Branch: Hardware & Networking	Credits:1.5
Semester: IV	
Theory/Laboratory: <b>Laboratory</b>	Percentage of numerical/design problems: --
Internal max. marks: 30	Duration of end semester exam (ESE):--
External max. marks:20	Elective status: core/ <del>elective</del>
Total marks: 50	

**Instructions:** Sample exercises are given below and Instructor can increase or decrease the experiments as per the requirement.

<b>1</b>	To verify the Truth Table of Basic Logic Gates
<b>2</b>	To verify the Truth Table of Combinational Logic Gates
<b>3</b>	To verify the Truth Table of Universal Logic Gates
<b>4</b>	To verify the Truth Table of Half Adder Combinational Circuit
<b>5</b>	To verify the Truth Table of Full Adder Combinational Circuit
<b>6</b>	To verify the Truth Table of Half Subtractor Combinational Circuit
<b>7</b>	To verify the Truth Table of Full Subtractor Combinational Circuit
<b>8</b>	To verify the Truth Table of Multiplexer Combinational Circuit
<b>9</b>	To verify the Truth Table of De Multiplexer Combinational Circuit
<b>10</b>	To verify the Truth Table of S-R Flip-Flop and J-K Flip-Flop
<b>11</b>	To verify the Truth Table of Asynchronous counter
<b>12</b>	To verify the Truth Table of Synchronous counter

**Reference Books:**

1. Computer Organization and Architecture, Stallings, Eighth Edition, PHI.
2. Modern Digital Electronics, R. P. Jain, Fourth Edition, TMH.
3. Digital Logic & Computer Design, D. Morris Mano, Second Edition, PHI.
4. Digital and Electronic Circuits, T. C. Bartee, McGraw Hill.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN 406-18**

Course Name: **Problem Solving using C++ Laboratory**

Program: B.Voc	L:0 T:0 P:3
Branch: Hardware & Networking	Credits:1.5
Semester: III	
Theory/Laboratory: <b>Laboratory</b>	Percentage of numerical/design problems: --
Internal max. marks: <b>30</b>	Duration of end semester exam (ESE):--
External max. marks: <b>20</b>	Elective status: core/ <del>elective</del>
Total marks: <b>50</b>	

**Instructions: Develop all programs in C++ programming language.**

<b>1</b>	Write a program to enter mark of 6 different subjects and find out the total mark (Using cin and cout statement).
<b>2</b>	Write a function using reference variables as arguments to swap the values of pair of integers.
<b>3</b>	Write a function to find largest of three numbers.
<b>4</b>	Write a program to find the factorial of a number.
<b>5</b>	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.
<b>6</b>	Write a program for single inheritance.
<b>7</b>	Write a program for use of constructor and destructors.
<b>8</b>	Write a program for Multiple inheritance.
<b>9</b>	Write a program for Multilevel inheritance
<b>10</b>	Write a program for file handling.

**Reference Books:**

1. Object Oriented Programming with C++, E. Balagurusami, Fourth Edition, Tata Mc-Graw Hill.
2. Object Oriented Programming in Turbo C++, Robert Lafore, Fourth Edition Galgotia Publications.
3. The C++ Programming Language, Bjarna Stroustrup, Third Edition, AddisonWesley Publishing Company.
4. Object Oriented Programming Using C++, Salaria, R. S, Fourth Edition, Khanna Book Publishing

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN501-18**

Course Name: **Programming in Python**

Program: B.Voc	L: 3 P: 0
Branch: Hardware & Networking	Credits: 3
Semester: 5th	Contact hours: 44 hours
Theory/Practical: Theory	Percentage of numerical/design problems: 40%
Internal max. marks: 40	Duration of end semester exam (ESE): 3hrs
External max. marks: 60	Elective status: Core
Total marks: 100	

**Prerequisite:** -NA-

**Co requisite:** -NA-

**Additional material required in ESE:** -NA-

**Course Outcomes:** Students will be able to:

CO#	Course Outcomes
CO1	Familiar with Python environment, data types, operators used in Python.
CO2	Compare and contrast Python with other programming languages.
CO3	Learn the use of control structures and numerous native data types with their methods.
CO4	Design user defined functions, modules, and packages and exception handling methods.
CO5	Create and handle files in Python and learn Object Oriented Programming Concepts

Detailed Contents	Contact hours
<p><b>Unit-I</b>            Introduction to Python Programming Language: Programming Language, History and Origin of Python Language, Features of Python, Limitations, Major Applications of Python, First Python Program, Python Interactive Help Feature, Python differences from other languages.            Python Data Types &amp; Input/Output: Keywords, Identifiers, Python Statement, Indentation, Documentation, Variables, Multiple Assignment, Understanding Data Type, Data Type Conversion, Python Input and Output Functions, Import command.            Operators and Expressions: Operators in Python, Expressions, Precedence, Associativity of Operators, Non Associative Operators.</p>	<b>12</b>
<p><b>Unit-II</b>            Control Structures: Decision making statements, Python loops, Python control statements.            Python Native Data Types: Numbers, Lists, Tuples, Sets, Dictionary, Functions &amp; Methods of Dictionary, Strings (in detail with their methods and operations).</p>	<b>10</b>
<p><b>Unit-III</b>            Python Functions: Functions, Advantages of Functions, Built-in Functions, User defined functions, Anonymous functions, Pass by value Vs. Pass by Reference, Recursion, Scope and Lifetime of Variables.            Python Modules: Module definition, Need of modules, Creating a module, Importing module, Path Searching of a Module, Module Reloading, Standard Modules, Python Packages.</p>	<b>12</b>
<p><b>Unit-IV</b>            Exception Handling: Exceptions, Built-in exceptions, Exception handling, User defined exceptions in Python.            File Management in Python: Operations on files (opening, modes, attributes, encoding, closing), read() &amp; write() methods, tell() &amp; seek() methods, renaming &amp; deleting files in Python.            Introduction to the concept of OOPS in Python.</p>	<b>10</b>

**Text Books:**

1. Programming in Python, Pooja Sharma, BPB Publications, 2017.
2. Core Python Programming, R. Nageswara Rao, 2nd Edition, Dreamtech.

**Reference Books:**

1. Python, The complete Reference, Martin C. Brown, Mc Graw Hill Education.
2. Python in a Nutshell, A. Martelli, A. Ravenscroft, S. Holden, OREILLY.



**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

**Course Code: BVHN502-18**

**Course Name: E-Commerce**

<b>Program:</b> B.Voc	<b>L:3 P:0</b>
<b>Branch:</b> Hardware & Networking	<b>Credits:</b> 3
<b>Semester:</b> 5 <sup>th</sup>	<b>Contact hours:</b> 40
<b>Theory/Practical:</b> Theory	<b>Percentage of numerical/design problems:</b> --
<b>Internal max. marks:</b> 40	<b>Duration of end semester exam (ESE):</b> --
<b>External max. marks:</b> 60	<b>Elective status:</b> core/elective
<b>Total marks:</b> 100	

**Prerequisite:** --

**Co requisite:** --

**Additional material required in ESE:** --

**Course Outcomes:**

CO#	Course outcomes
CO1	To understand of various applications and scope of ecommerce.
CO2	To know the working of various payment modes used in ecommerce today.
CO3	Understand how and why to use digital marketing for multiple goals within a larger marketing and/or media strategy,
CO4	Understand the major digital marketing channels - online advertising: Digital display, video, mobile, search engine,
CO5	Students will be able to explore the latest digital ad technologies

Detailed Contents	Contact hours
<p><b>Unit-I</b>  E-Commerce : Need and Origin of E-Commerce, Factors affecting E -Commerce, E-Commerce framework Electronic Commerce Models, Value Chains in Electronic Commerce. Internet and E-Business Introduction to Internet and its application, Intranet and Extranets. World Wide Web, Internet Architectures, Internet Applications, Business Applications on Internet, E - Shopping, Electronic Data Interchange, Components of Electronic Data Interchange.</p> <p>Applications in E-commerce: E-commerce Applications in Manufacturing, Wholesale, Retail and Service Sector</p>	<b>10</b>
<p><b>Unit-II</b>  Online Payment Systems  Mechanism of Making Payment Through Internet, Online Payment Mechanism, Electronic Payment Systems, Payment Gateways, Plastic Money, Debit Card, Credit Card, Laws Relating to Online Transactions.</p>	<b>10</b>
<p><b>Unit-III</b>  Digital Marketing: Understanding Digital Marketing Process, Digital marketing vs. Traditional marketing, Website Planning Process: Understanding Domain names &amp; Domain extensions, Search Engine Optimization: Social media marketing, How social media marketing is different than others Forms of Internet marketing, Google analytics: Introduction to Google Analytics, how Google Analytics works, Google Ad Words &amp; Online Display advertising</p>	<b>10</b>
<p><b>Unit-IV</b>  Email marketing  Need, working and challenges faced in sending bulk emails, Types of email marketing- Opt-in &amp; bulk emailing, Content marketing</p> <p>Affiliate marketing: Sources to Make Money Online, Blogging &amp; freelancing to make money, Ad Sense, approval process and Ad Sense Administration. E Business Entrepreneurship.</p>	<b>10</b>

**Text Books**

1. Whitley, David, "E-Commerce Strategy, Technologies and Applications", Tata McGraw Hill.
2. Gary P. and Perry, James T., "Electronic Commerce, Schneider", Thomson Learning.
3. Bajaj, Kamlesh K & Nag, Debjani, "E-Commerce: The Cutting Edge of Business", McGraw Hill
4. Laudon and Traver, "E-Commerce: Business, Technology & Society", Pearson Education

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

**Course Code: BVHN 503-18**

**Course Name: Microprocessor and Microcontroller.**

<b>Program:</b> B.Voc	<b>L: 3 P: 0</b>
<b>Branch:</b> Hardware & Networking	<b>Credits: 3</b>
<b>Semester:</b> 5 <sup>th</sup>	<b>Contact hours: 40</b>
<b>Theory/Practical:</b> Theory	<b>Percentage of numerical/design problems: --</b>
<b>Internal max. marks:</b> 40	<b>Duration of end semester exam (ESE):--</b>
<b>External max. marks:</b> 60	<b>Elective status: core/elective</b>
<b>Total marks:</b> 100	

**Prerequisite: --**

**Co requisite: --**

**Additional material required in ESE: --**

**Course Outcomes:**

CO#	Course outcomes
CO1	Students will be able to understand pin diagram and architecture of various microprocessors.
CO2	Students will be able to understand the architecture of various controllers in a computer system.
CO3	Students will be able to understand assembly level programs.

Detailed Contents	Contact hours
<b>Unit-I</b> <b>Introduction to Microprocessors</b> , Historical Background of Microprocessors, Applications of Microprocessors, Introduction to 8085, Architecture of 8085, Pin Diagram of 8085.	<b>10</b>
<b>UNIT-II</b> Instruction Cycle, Timing Diagrams of Memory Read/Write Operations, I/O read and write operations, Addressing Modes, Introduction to RISC & CISC Processors.	<b>10</b>
<b>Unit-III</b> Introduction to Microcontroller, Architecture of Microcontroller, Features of Microcontroller, Advantages of Microcontroller, comparison between Microcontroller and Microprocessor. Applications of Microcontroller.	<b>10</b>
<b>Unit-IV</b> Introduction to 8257 DMA controller, Features of 8257 DMA controller, Internal architecture of 8257, interfacing of 8257 with 8085, Pin diagram of 8257 DMA controller.	<b>10</b>

**Text/Reference Books:**

1. Microprocessor Architecture, Programming and Applications with 8085, Ramesh. S. Gaonkar, Fourth Edition, Penram International Publishing
2. 8051 Microcontroller and Embedded Systems, Muhammad Ali Mazidi Janice Gillispie Mazidi, Second Edition, PHI
3. Fundamentals of Microprocessors and Microcomputers, B. Ram, Fourth Edition, Dhanpat Rai Publications
4. The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium Pro Architecture, Programming and Interfacing, B. Brey, Fifth Edition, Prentice Hall International

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

**Course Code: BVHN504-18**  
**Course Name: Cyber Security**

<b>Program:</b> B. Voc	<b>L: 3 P: 0</b>
<b>Branch:</b> Hardware & Networking	<b>Credits: 3</b>
<b>Semester:</b> 5 <sup>th</sup>	<b>Contact hours: 40</b>
<b>Theory/Practical:</b> Theory	<b>Percentage of numerical/design problems: --</b>
<b>Internal max. marks:</b> 40	<b>Duration of end semester exam (ESE):--</b>
<b>External max. marks:</b> 60	<b>Elective status: core/elective</b>
<b>Total marks:</b> 100	

**Prerequisite: --**

**Co requisite: --**

**Additional material required in ESE: --**

**Course Outcomes:**

CO#	Course outcomes
CO1	To teach the students analysis and practicality of various systems on which software system can be developed.
CO2	After completing this course Students will be able to design and develop systems.
CO3	Students will be able to learn about the system development lifecycle model.
CO4	Students will be able to learn about how to design the system and how to find and remove errors with
CO5	Student will be able to understand how system should be implemented and maintained.

Detailed Contents	Contact hours
<b>Unit I</b> Introduction to Cyber Security Overview of Cyber Security, Internet Governance – Challenges and Constraints, Cyber Threats:- Cyber Warfare-Cyber Crime-Cyber terrorism-Cyber Espionage, Need for a Comprehensive Cyber Security Policy, Need for a Nodal Authority, Need for an International convention on Cyberspace	<b>10</b>
<b>UNIT-II</b> Cyber Security Vulnerabilities and Cyber Security Safeguards Cyber Security Vulnerabilities-Overview, vulnerabilities in software, System administration, Complex Network Architectures, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications, Poor Cyber Security Awareness. Cyber Security Safeguards- Overview, Access control, Audit, Authentication, Biometrics, Cryptography, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Intrusion Detection Systems, Response, Scanning, Security policy, Threat Management.	<b>10</b>
<b>Unit-III</b> Intrusion Detection and Prevention Intrusion, Physical Theft, Abuse of Privileges, Unauthorized Access by Outsider, Malware infection, Anti-Malware software, Network based Intrusion detection Systems, Network based Intrusion Prevention Systems, Host based Intrusion prevention Systems, Security Information Management, Network Session Analysis, System Integrity Validation.	<b>10</b>
<b>Unit-IV</b> Cyberspace and the Law: Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy 2013. Cyber Forensics: Introduction to Cyber Forensics, Scrutinizing E-mail, Validating E-mail header information, Tracing Internet access, Tracing memory in real-time.	<b>10</b>

**Text Books**

1. System Analysis and Design Awad Elias N.*Second Edition*,Galgotia Publications
2. Analysis and Design of Information System Sen James A.*Second Edition*, Tata McGraw Hill.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

**Course Code: BVHN505-18**

**Course Name: Programming in Python Laboratory**

<b>Program:</b> B.Voc	<b>L:0 P: 3</b>
<b>Branch:</b> Hardware & Networking	<b>Credits:</b> 1.5
<b>Semester:</b> 5th	<b>Contact hours:</b> 4 hours per week
<b>Theory/Practical:</b> Practical	<b>Percentage of numerical/design problems:</b> 90%
<b>Internal max. marks:</b> 30	<b>Duration of end semester exam (ESE):</b> 3hrs
<b>External max. marks:</b> 20	<b>Elective status:</b> Core
<b>Total marks:</b> 50	

**Prerequisite:** -NA-

**Co requisite:** -NA-

**Additional material required in ESE:** - Maintain practical note book as per the instructions given by the instructor.

**Course Outcomes:** Students will be able to :

CO#	Course Outcomes
CO1	Solve simple to advanced problems using Python language.
CO2	Develop logic of various programming problems using numerous data types and control structures of Python.
CO3	Implement different data structures.
CO4	Implement modules and functions.
CO5	Design and implement the concept of OOP structures.
CO6	Implement file handling.

**List of Practicals:**

1.	Compute sum, subtraction, multiplication, division and exponent of given variables input by the user.
2.	Compute area of following shapes: circle, rectangle, triangle, square, trapezoid and parallelogram.
3.	Compute volume of following 3D shapes: cube, cylinder, cone and sphere.
4.	Compute and print roots of quadratic equation $ax^2+bx+c=0$ , where the values of a, b, and c are input by the user.
5.	Print numbers up to N which are not divisible by 3, 6, 9,, e.g., 1, 2, 4, 5, 7,....
6.	Print multiplication table of a number input by the user
7.	Compute sum of natural numbers from one to n number
8.	Print Fibonacci series up to n numbers e.g. 0 1 1 2 3 5 8 13.....n
9.	Compute factorial of a given number.
10.	Perform following operations on two matrices. 1) Addition 2) Subtraction 3) Multiplication
11.	Perform following operations on a list of numbers: 1) Insert an element 2) delete an element 3) sort the list 4) delete entire list
12.	Display word after Sorting in alphabetical order
13.	Perform sequential search on a list of given numbers.
14.	Write a Python function that accepts a string and calculates number of upper case letters and lower case letters available in that string.
15.	To find the Max of three numbers using functions
16.	Design a Python class named Rectangle, constructed by a length & width, also design a method which will compute the area of a rectangle.
17.	Design a Python class to reverse a string 'word by word'.
18.	Write a Python program to read an entire text file.
19.	Design a Python program to read first n lines of a text file
20.	Construct a Python program to write and append text to a file and display the text.

**Text Books:**

1. Programming in Python, Pooja Sharma, BPB Publications, 2017.
2. Core Python Programming, R. Nageswara Rao, 2nd Edition, Dreamtech.

**Reference Books:**

1. Python, The complete Reference, Martin C. Brown, Mc Graw Hill Education.
2. Python in a Nutshell, A. Martelli, A. Ravenscroft, S. Holden, OREILLY.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

**Course Code: BVHN506-18**

**Course Name: HARDWARE LAB-II (Microprocessors )**

<b>Program:</b> B.Voc	<b>L:0 P: 3</b>
<b>Branch:</b> Hardware & Networking	<b>Credits:</b> 1.5
<b>Semester:</b> 5th	<b>Contact hours:</b> 4 hours per week
<b>Theory/Practical:</b> Practical	<b>Percentage of numerical/design problems:</b> 90%
<b>Internal max. marks:</b> 30	<b>Duration of end semester exam (ESE):</b> 3hrs
<b>External max. marks:</b> 20	<b>Elective status:</b> Core
<b>Total marks:</b> 50	

**Prerequisite:** -NA-

**Co requisite:** -NA-

**Additional material required in ESE:** - Maintain practical note book as per the instructions given by the instructor.

**Course Outcomes:** Students will be able to :

<b>CO#</b>	<b>Course Outcomes</b>
CO1	Solve simple to complex problems using assembly language.
CO2	Solve 1's and 2's complement of various numbers
CO3	Solve addition, subtraction and complement of 8 bit and 16 bit numbers.

**List of Practicals:**

1.	To examine and modify the contents of a register and memory location.
2.	To add two 8-bit hexadecimal numbers without considering the carry generated.
4.	To subtract two 8-bit hexadecimal numbers without considering borrow.
5.	To subtract two 8-bit hexadecimal numbers considering borrow.
6.	To add two 16-bit hexadecimal numbers without considering the carry generated.
7.	To add two 16-bit hexadecimal numbers considering the carry generated.
8.	To subtract two 16-bit numbers without considering borrow.
9.	To subtract two 16-bit numbers considering borrow.
10.	To find 2's complement of 8-bit hexadecimal number.

**Text/Reference Books:**

1. Microprocessor Architecture, Programming and Applications with 8085, Ramesh. S. Gaonkar, Fourth Edition, Penram International Publishing
2. 8051 Microcontroller and Embedded Systems, Muhammad Ali Mazidi Janice Gillispie Mazidi, Second Edition, PHI
3. Fundamentals of Microprocessors and Microcomputers, B. Ram, Fourth Edition, Dhanpat Rai Publications

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN 601-18**  
 Course Name: **Web Designing**

<b>Program:</b> B.Voc	<b>L: 3 P: 0</b>
<b>Branch:</b> Hardware & Networking	<b>Credits: 3</b>
<b>Semester:</b> 6 <sup>th</sup>	<b>Contact hours:</b> 40 hours
<b>Theory/Practical:</b> Theory	<b>Percentage of numerical/design problems: --</b>
<b>Internal max. marks:</b> 40	<b>Duration of end semester exam (ESE):--</b>
<b>External max. marks:</b> 60	<b>Elective status:</b> core/elective
<b>Total marks:</b> 100	

<b>Detailed contents</b>	<b>Contact hours</b>
<p><b>Unit 1</b>  <b>Internet Basics:</b> Basic concepts, communicating on the internet, internet domains, internet server identities.  <b>Introduction To HTML:</b> Information Files Creation, Web Server, Web Client/Browser, Hyper Text Markup Language (HTML Tags, Paired Tags, Singular Tags), Commonly Used Html Commands (Document Head, Document Body), Title and Footer, Text Formatting (Paragraph Breaks, Line Breaks), Emphasizing Material in a Web Page (Heading Styles, Drawing Lines).                      Basic Formatting Tags                      HTML Basic Tags, Text Formatting (Paragraph Breaks, Line Breaks), Emphasizing Material in a Web Page (Heading Styles, Drawing Lines), Text Styles (Bold, Italics, Underline), Other Text Effects (Centering (Text, Images etc.), Spacing (Indenting Text), HTML Color Coding.</p>	10
<p><b>Unit 2:</b>  <b>Lists :</b>Type of Lists (Unordered List (Bullets), Ordered Lists (Numbering), Definition Lists.  <b>Adding Graphics To Html Documents :</b>Using The Border Attribute, Using The Width And Height Attribute, Using The Align Attribute, Using The Alt Attribute.  <b>Tables :</b>Introduction (Header, Data rows, The Caption Tag), Using the Width and Border Attribute, Using the Cell spacing Attribute, Using the BGCOLOR Attribute, Using the COLSPAN and ROWSPAN Attributes  <b>Linking Documents:</b> Links (External Document References, Internal Document References), Image As Hyperlinks.  <b>Frames :</b>Introduction to Frames: The&lt;FRAMESET&gt; tag, The &lt;FRAME&gt; tag, Targeting Named Frames. DHTML: Cascading Style Sheets, Style Tag.</p>	10
<p><b>Unit 3:</b>  <b>Forms Used by a Web Site:</b> The Form Object, The Form Object's Methods (The Text Element, The Password Element, The Button Element, The Submit (Button) Element, The Reset (Button) Element, The Checkbox Element, The Radio Element, The Text Area Element, The Select and Option Element, The Multi Choice Select Lists Element).</p>	10
<p><b>Unit 4:</b>  <b>Introduction to JavaScript :</b>JS Introduction, Where To, Output, Statements, Syntax, Comments, Variables, Operators, Arithmetic, Assignment, Data Types, Functions, Numbers, Number Methods, Arrays, Array Methods, Array Sort, Array Iteration, Dates, Date Formats, Date Get Methods, Date Set Methods, Math, Random, Booleans, Comparisons, Conditions, Switch, Loop For, Loop While, Break.</p>	10

**Text Books: Text Books/Reference Books:**

1. Internet for EveryOne: Alexis Leon, 1st Edition, Leon Techworld, Publication, 2009.
2. Greenlaw R; Heppe, "Fundamentals of Internet and WWW", 2nd Edition, Tata McGraw-Hill, 2007.
3. Raj Kamal, "Internet& Web Technologies", edition Tata McGraw-Hill Education.2009.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

**Course Code : BVHN602-18**  
**Course Name: Environment Science**

<b>Program:</b> B.Voc	<b>L: 3 P: 0</b>
<b>Branch:</b> Hardware & Networking	<b>Credits:</b> 3
<b>Semester :</b> 6 <sup>th</sup>	<b>Contact hours:</b> 40
<b>Theory/Practical :</b> Theory	<b>Elective status:</b> core/elective
<b>Internal max. marks:</b> 40	
<b>External max. marks:</b> 60	
<b>Total marks:</b> 100	

<b>Detailed contents</b>	<b>Contact hours</b>
<b>Unit 1: Introduction to Environmental Studies</b> Multidisciplinary nature of Environmental Studies: Scope & Importance, Need for Public Awareness.	<b>10</b>
<b>Unit 2: Ecosystems, Concept of an Ecosystem:</b> Structure & functions of an ecosystem (Producers, Consumers & Decomposers) Energy Flow in an ecosystem: Food Chain, Food web and Ecological Pyramids <b>Characteristic features, structure &amp; functions of following Ecosystems:</b> <ul style="list-style-type: none"> <li>• Forest Ecosystem</li> <li>• Aquatic Ecosystem (Ponds, Lakes, River &amp; Ocean)</li> </ul>	<b>10</b>
<b>Unit 3: Natural Resources</b> Renewable & Non-renewable resources <b>Forest Resources:</b> Their uses, functions & values (Biodiversity conservation, role in climate change, medicines) & threats (Overexploitation, Deforestation) <b>Water Resources:</b> Their uses (Agriculture, Domestic & Industrial), functions & values, Overexploitation and Pollution of Ground & Surface water resources (Case study of Punjab), Water Conservation, Rainwater Harvesting <b>Land Resources:</b> Land as a resource; Land degradation, soil erosion and desertification. <b>Energy Resources:</b> Renewable & non-renewable energy resources, use of alternative energy resources.	<b>10</b>
<b>Unit 4: Biodiversity conservation and Environmental Pollution</b> <b>Types of Biodiversity:</b> Species, Genetic & Ecosystem ,India as a mega biodiversity nation, Biodiversity hot spots and biogeographic regions of India <b>Environmental Pollution :</b> Types, Causes, Effects & Control of Air, Water, Soil & Noise Pollution ,Nuclear hazards and accidents & Health risks <b>Global Climate Change:</b> Global warming, Ozone depletion, Acid rain, Melting of Glaciers & Ice caps, Rising sea levels <b>Environmental disasters:</b> Earthquakes, Floods, Cyclones, Landslides	<b>10</b>

**Text Books:**

1. Bharucha, E. Text Book for Environmental Studies. University Grants Commission, New Delhi.
2. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
3. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380 013, India, Email:mapin@icenet.net (R)
4. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
5. Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)
6. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p
7. De A.K., Environmental Chemistry, Wiley Eastern Ltd.
8. Down to Earth, Centre for Science and Environment (R)
9. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p
10. Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
11. Heywood, V.H & Waston, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

**Course Code : BVHN603-18**  
**Course Name: Operating System**

<b>Program:</b> B.Voc	<b>L: 3 P: 0</b>
<b>Branch:</b> Hardware & Networking	<b>Credits:3</b>
<b>Semester :</b> 6 <sup>th</sup>	<b>Contact hours: 40</b>
<b>Theory/Practical :</b> Theory	<b>Elective status:</b> core/elective
<b>Internal max. marks:</b> 40	
<b>External max. marks:</b> 60	
<b>Total marks:</b> 100	

<b>Detailed contents</b>	<b>Contact hours</b>
<b>Unit 1:</b> <b>Fundamentals of Operating system:</b> What is Operating system? Functions of an operating system. Operating system as a resource manager. Structure of operating system (Role of kernel and Shell). Views of operating system. Evolution and types of operating systems. <b>Process &amp; Thread Management:</b> Program vs. Process; PCB, State transition diagram, Scheduling Queues, Types of schedulers, Concept of Thread, Benefits, Types of threads, synchronization issues. <b>CPU Scheduling:</b> Need of CPU scheduling, CPU I/O Burst Cycle, Pre-emptive vs. Non-pre-emptive scheduling, Different scheduling criteria's, scheduling algorithms (FCFS, SJF, Round-Robin, Multilevel Queue).	10
<b>Unit 2:</b> <b>Memory Management:</b> Introduction, address binding, relocation, loading, linking, memory sharing and protection; Paging and segmentation; Virtual memory: basic concepts of demand paging, page replacement algorithms.	10
<b>Unit 3: I/O Device Management:</b> I/O devices and controllers, device drivers; disk storage <b>File Management:</b> Basic concepts, file operations, access methods, directory structures and management, remote file systems; file protection.	10
<b>Unit 4:</b> <b>Advanced Operating systems:</b> Introduction to Distributed Operating system, Characteristics, architecture, Issues, Communication & Synchronization; Introduction Multiprocessor Operating system, Introduction to Real-Time Operating System and its Characteristics.	10

**Text Books:**

1. Operating System Principles by Abraham Silberschatz and Peter Baer Galvin, Seventh Edition, Published by Wiley-India.
2. Principals of Operating System by Naresh Chauhan, Published by OXFORD University Press, India.

**Reference Books:**

1. Operating Systems by Sibsankar Haldar and Alex A. Aravind, Published by Pearson Education.
2. Operating system by Stalling, W., Sixth Edition, Published by Prentice Hall (India) .



**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

**Code: BVHN604-18**

**Course Name: Computer Peripherals and Interfaces**

Program: B.Voc	L: 3 P: 0
Branch: Hardware & Networking	Credits:3
Semester : 6 <sup>th</sup>	Contact hours: 40
Theory/Practical : Theory	Elective status: core/ <del>elective</del>
Internal max. marks: 40	
External max. marks:60	
Total marks:100	

Detailed contents	Contact hours
<b>Unit 1: SYSTEM RESOURCES:</b> Interrupt, DMA Channel, I/O Port Addresses and resolving and resolving the conflict of resources. I/O buses- ISA, EISA, Local bus, VESA Local bus, PCI bus, PCI Express, Accelerated graphics port bus.	10
<b>Unit 2: IDE &amp; SCSI Interfaces:</b> IDE origin, IDE Interface ATA standards ATA1 to ATA7. ATA feature, ATA RAID and SCSI RAID, SCSI Cable and pin Connector pin outs SCSI V/s IDE Advantages and limitation.	10
<b>Unit 3: Video Hardware :</b> Video display technologies, DVI Digital signals for CRT Monitor,LCD Panels, Video adapter types, Integrated Video/ Motherboard chipset, Video RAM, Video driver and multiple Monitor, Graphic accelerators.	10
<b>Unit 4: I/O Interfaces:</b> I/O Interfaces from USB and IEEE1394, I/O Interface from serial and Parallel to IEEE1394 and USB 961, Parallel to SCSI converter. Testing of serial and parallel port, USB Mouse/ Keyboard Interfaces.  <b>Input/ Output Driver software aspects:</b> Role of device driver DOS and UNIX/ LINUX device drivers.	10

**Text/Reference Books:**

1. Douglas V. Hall ,“Microprocessors and Interfacing”, Tata McGraw Hill 2006.
2. Barry B. Brey & C.R.Sarma” The intel microprocessors,” Pearson 2003.
3. P. Pal Chandhari , “Computer Organization and design” Prentice Hall of India Pvt. Ltd, 1994.
4. Del Corso, H.Kirman, JD Nicond “Microcomputer buses & links” Academic Press 1986.

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

**Course Code: BVHN 605-18**  
**Course Name: Web Designing Laboratory**

<b>Program:</b> B.Voc	<b>L: 0 P: 3</b>
<b>Branch:</b> Hardware & Networking	<b>Credits:</b> 1.5
<b>Semester:</b> 6 <sup>th</sup>	<b>Contact hours:</b> 24 hours
<b>Theory/Practical:</b> Practical	<b>Percentage of numerical/design problems: --</b>
<b>Internal max. marks:</b> 30	<b>Duration of end semester exam (ESE):--</b>
<b>External max. marks:</b> 20	<b>Elective status:</b> core/elective
<b>Total marks:</b> 50	

**Instructions:** Instructor can increase/decrease the experiments as per the requirement.

<b>1</b>	Create a simple HTML page to demonstrate the use of different tags.
<b>2</b>	Design index page of a book on web designing.
<b>3</b>	Display Letter Head of your college on a web page.
<b>4</b>	Create a Hyperlink to move around within a single page rather than to load another page.
<b>5</b>	Display letter using different Text formatting Tags.
<b>6</b>	Design Time Table of your department and highlights of most important periods.
<b>7</b>	Use Tables to provide layout to your web page.
<b>8</b>	Design a web page and display two different pages at a time.
<b>9</b>	Write an HTML code To create a Registration Form. On submitting the form, the user should be asked to login with the new credentials.
<b>10</b>	Write a program to perform following operations on two numbers input by the user: Addition 2) subtraction 3) multiplication 4) division

**Reference Books:**

1. Greenlaw R; Hepp E, "Fundamentals of Internet and www", 2nd Edition, Tata . McGraw-Hill, 2007.
2. A Beginner's Guide to HTML [Http://www.Ncsa.Nine.Edit/General/Internet/www/ html.prmter](http://www.Ncsa.Nine.Edit/General/Internet/www/html.prmter).

**Online Experiment material**

1. [https://www.w3schools.com/html/html\\_examples.asp](https://www.w3schools.com/html/html_examples.asp)
2. [https://www.cs.uct.ac.za/mit\\_notes/web\\_programming.html](https://www.cs.uct.ac.za/mit_notes/web_programming.html)

**IK Gujral Punjab Technical University Jalandhar**  
**B. Voc. (Hardware and Networking), Batch-2018**

Course Code: **BVHN 606-18**

Course Name: **Operating System Laboratory**

<b>Program:</b> B.Voc	<b>L: 0 P: 3</b>
<b>Branch:</b> Hardware & Networking	<b>Credits:</b> 1.5
<b>Semester:</b> 6th	<b>Contact hours:</b> 24 hours
<b>Theory/Practical:</b> Practical	<b>Percentage of numerical/design problems:--</b>
<b>Internal max. marks:</b> 30	<b>Duration of end semester exam (ESE):--</b>
<b>External max. marks:</b> 20	<b>Elective status: core/elective</b>
<b>Total marks:</b> 50	

<b>1</b>	Installation of windows OS.
<b>2</b>	Installation of Linux OS.
<b>3</b>	Dual boot installation of Operating systems.
<b>4</b>	Implementation of FCFS Scheduling algorithm.
<b>5</b>	Implementation of SJF Scheduling algorithm.
<b>6</b>	Implementation of Round-Robin Scheduling algorithm.
<b>7</b>	Vi Editor & its commands.
<b>8</b>	Shell Commands.
<b>9</b>	Shell Scripting- Using variables.
<b>10</b>	Shell Scripting- Input & Output.

**Reference Books:**

1. Linux: The complete reference by Richard Petersen, Published by Tata McGraw- Hill Publication.
2. Operating System Principles by Abraham Silberschatz and Peter Baer Galvin, Seventh Edition, Published by Wiley-India.