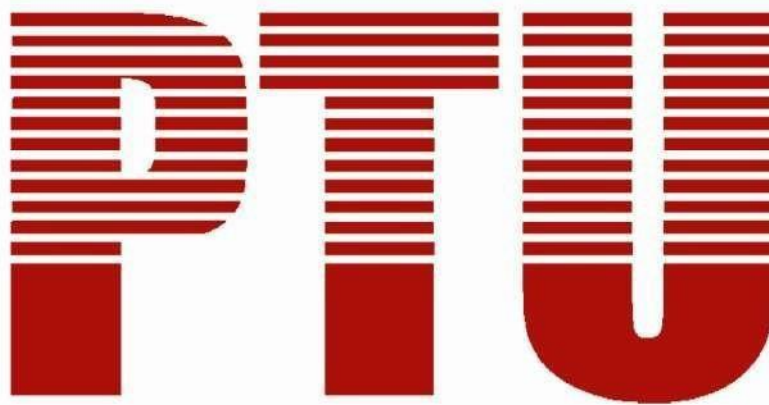


Scheme & Syllabus of Bachelor of Vocational Studies (B. Voc.) Hardware & Networking Batch 2025



By
Department of Academics
IKG Punjab Technical University

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

Semester1st

CourseCode	CourseTitle	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BVHN101-18	PCHardware	3	0	40	60	100	3
BVHN102-18	ComputerNetworking	3	0	40	60	100	3
BVHN103-18	CommunicativeEnglish	3	0	40	60	100	3
BVHN104-18	BasicITSkills	3	0	40	60	100	3
BVHN105-18	PCHardware Laboratory	0	3	30	20	50	1.5
BVHN106-18	ComputerNetworking Laboratory	0	3	30	20	50	1.5
BVDW204-21	Mathematics	3	0	40	60	100	3
On-JobTraining/QualificationPack*							
BVHN107-18	Servicetechnician ->SeniorService Technician->Service Supervisor	OnJobTraining(OJT) in Collaboration with MoU industry		200	200	15	
Total		12	6	200	500	700	30

***Thequalificationpacksmayvaryfrominstituteto institute.**

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

Semester2nd

CourseCode	CourseTitle	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	Programmingin Java	3	1	0	40	60	100	4
BVHN203-18	ProjectWork-1	0	0	8	60	40	100	4
BVHN204-18	Database Management SystemsLaboratory	0	0	3	30	20	50	1.5
BVHN205-18	Programming in Java Laboratory	0	0	3	30	20	50	1.5
EMC-101-25	Entrepreneurship Setup and Launch **	0	0	4	30	20	50	2
On-JobTraining/QualificationPack*								
BVHN206-18	AndroidApps Developer	OnJobTraining(OJT)in Collaboration with MoU industry			200	200	200	15
Total								30

** The department of Higher Education and Languages, Government of Punjab endeavor to AI-powdered entrepreneurship learning platform on the said course. The Institute /Campus shall appoint an assistant professor as faculty coordinator.

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

Semester 3rd

CourseCode	CourseTitle	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BVHN301-18	Datawarehousingand Mining	3	0	40	60	100	3
BVHN302-18	ProblemSolvingUsingC	3	0	40	60	100	3
BVHN303-18	Human Values & ProfessionalEthics	3	0	40	60	100	3
BVHN304-18	Managementinformation System	3	0	40	60	100	3
BVHN305-18	ProblemSolvingusingC Laboratory	0	3	30	20	50	1.5
BVHN306-18	Workshop on Desktop PublishingLaboratory	0	3	30	20	50	1.5
On-JobTraining							
BVHN307-18	ProjectWork-II				200	200	15
Total							30

Semester4th

CourseCode	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BVHN401-18	InformationSecurity	3	0	40	60	100	3
BVHN402-18	SoftwareEngineering	3	0	40	60	100	3
BVHN403-18	Object Oriented ProgrammingusingC++	3	0	40	60	100	3
BVHN404-18	ComputerSystem Architecture	3	0	40	60	100	3
BVHN405-18	Computer System ArchitectureLaboratory	0	3	30	20	50	1.5
BVHN406-18	Object Oriented ProgrammingusingC++ Laboratory	0	3	30	20	50	1.5
On-JobTraining/QualificationPack*							
BVHN407-18	Networking Specialist	OnJobTraining(OJT)in Collaboration with MoU industry			200	200	15
	Total						30

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Semester5th

CourseCode	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Int	Ext		
BVHN501-18	Programmingin Python	3	0	40	60	100	3
BVHN502-18	E-Commerce	3	0	40	60	100	3
BVHN503-18	Microprocessorand Microcontroller.	3	0	40	60	100	3
BVHN504-18	CyberSecurity	3	0	40	60	100	3
BVHN505-18	Programmingin Python Laboratory	0	3	30	20	50	1.5
BVHN506-18	Microprocessorand Microcontroller Laboratory	0	3	30	20	50	1.5
On-JobTraining/QualificationPack*							
BVHN507-18	OnJobTraining(OJT)inCollaborationwith MoU industry				200	200	15
	Total						30

Semester6th

CourseCode	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Int	Ext		
BVHN601-18	WebDesigning	3	0	40	60	100	3
BVHN602-18	EnvironmentScience	3	0	40	60	100	3
BVHN603-18	OperatingSystem	3	0	40	60	100	3
BVHN604-18	ComputerPeripheralsand Interfaces	3	0	40	60	100	3
BVHN605-18	WebDesigning Laboratory	0	3	30	20	50	1.5
BVHN606-18	OperatingSystem Laboratory	0	3	30	20	50	1.5
On-JobTraining/QualificationPack*							
BVHN607-18	OnJobTraining(OJT)inCollaborationwith MoU industry				200	200	15
	Total						30

***Thequalificationpacksmayvaryfrominstituteto institute.**

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:**BVHN101-18**

CourseName: **PCHardware**

Program: B.Voc	L:3 T:0 P:0
Branch:Hardware &Networking	Credits:3
Semester: I	Contacthours:33
Theory/Laboratory:Theory	Electivestatus:core
Internalmax.marks:40	
Externalmax. marks:60	
Totalmarks:100	

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

SuggestedReadings

1. PCHardware:TheCompleteReference,McGraw-Hills
2. TheIndispensablePCHardwareBook(4thEdition)Hans-PeterMessmer
3. PCHardware:ABeginner'sGuidebyRonGilster

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:**BVHN102-18**

CourseName:**Computer Networking**

Program: B.Voc	L:3 T:0 P:0
Branch:Hardware &Networking	Credits:3
Semester:I	Contacthours:33
Theory/Laboratory:Theory	Electivestatus:core
Internalmax.marks:40	
Externalmax.marks: 60	
Totalmarks:100	

Detailedcontents	Contact hours
Unit 1 : Data Communications Concepts: Digital and analog transmissions-Modem, parallelandserial,synchronousandasynchronous,Modesofcommunication: Simplex, half duplex, full duplex, Concept of multiplexing, De-multiplexing. Types of Networks: LAN, MAN, WAN NetworkTopologies:Bus,Star,Ring,Mesh,Tree,Hybrid CommunicationChannels:Wiredtransmissions:Telephonelines,leasedlines, switch line, coaxial cables-base band, broadband, optical fiber transmission.	9
Unit 2 : TransmissionMedia:GuidedMedia(TwistedPairCable,CoaxialCable,Fiber Optics Cable), Unguided Media (Radio Waves, Microwaves, Infrared) Communication Devices (Switches, Hub, Routers, gateway etc) IntroductiontoSwitching:CircuitSwitchNetworks,DatagramSwitchNetworks Network Models.	8
Unit 3 : IntroductiontoOSIModel–PhysicalLayer,DataLinkLayer,NetworkLayer, Transport Layer, Session Layer, Presentation Layer TCP/IP(LayerArchitecture)DataLinkLayer,InternetLayer,TransportLayer, Application Layer	8
Unit 4 : MACsublayer:802.4TokenBus,IEEE802.5TokenRing Concept of Internetworking.	8

SuggestedReadings

1. ComputerNetworks, Tanenbaum,Andrew, FifthEdition,PHI
2. DataCommunicationandNetworking, Behrouz A.Forouzan,FourthEdition
3. ComputerToday,S.K.Basandra,FirstEdition,Galgotia
4. DataCommunicationSystem,Black,Ulysse,ThirdEdition,PHI
5. DataandComputerCommunications,Stalling,NinthEdition,PHI

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:**BVHN103-18**

CourseName : **Communication Skills**

Program: B.Voc	L:3 T:0 P:0
Branch:Hardware &Networking	Credits:3
Semester:I	Contacthours:33
Theory/Laboratory:Theory	Electivestatus:core
Internalmax.marks:40	
Externalmax.marks: 60	
Totalmarks:100	

Detailedcontents	Contact hours
Unit1-1(Introduction) - Theoryof Communication, - Typesandmodesof Communication	9
Unit-2(Languageof Communication) - VerbalandNon-verbal (SpokenandWritten) - Personal,SocialandBusiness - BarriersandStrategies - Intra-personal,Inter-personalandGroupcommunication	8
Unit-3(Readingand Understanding) - CloseReading - Comprehension - SummaryParaphrasing - AnalysisandInterpretation - Translation(fromHindi/PunjabitoEnglishandvice-versa - Literary/KnowledgeTexts	8
Unit-4(WritingSkills) - Documenting - Report Writing - Makingnotes - Letterwriting	8

RecommendedReadings:

1. Fluencyin English-Part II, Oxford UniversityPress, 2006.
2. BusinessEnglish,Pearson,2008.
3. PracticalEnglishUsage.MichaelSwan. OUP.1995.
4. CommunicationSkills.SanjayKumarand PushpLata.Oxford UniversityPress. 2011.
5. ExercisesinSpoken English

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:**BVHN104-18**

CourseName: **BasicIT Skill**

Program: B.Voc	L:3 T:0 P:0
Branch:Hardware &Networking	Credits:3
Semester:I	Contacthours:33
Theory/Laboratory:Theory	Electivestatus:core
Internalmax.marks:40	
Externalmax.marks: 60	
Totalmarks:100	

Detailedcontents	Contact hours
Unit1: HumanComputerInterface. ConceptsofHardwareandSoftware;Dataand 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
Unit2: ConceptofComputing&PCSoftware–I Concept of Computing. Types of Languages: Machine, assembly and High level Language; Operating system as user interface, utility programs. Wordprocessing:Editing features,formatting features,saving,printing,table handling, page settings, spell-checking, macros, mail-merge, equation editors.	8
Unit3: PCSoftware–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
Unit4: TheImpactofComputingandtheInterneton Society. ElectronicPaymentSystem:SecureElectronicTransaction,TypesofPaymentSystem: DigitalCash,ElectronicCheque,SmartCard,Credit/DebitCardE-Money,Immediate Payment System (IMPS).	8

Text Books:

1. IntroductiontoInformationTechnology,ITLEducationSolutionslimited,PearsonEducation
2. ComputerFundamentals,A.Goel,2010,PearsonEducation.
3. FundamentalsofComputers,P.K.Sinha&P.Sinha,2007,BPBPublishers.
4. ITTools,R.K.Jain,KhannaPublishingHouse
5. “IntroductiontoInformationTechnology”,SatishJain,AmbrishRai&ShashiSingh,PaperbackEdition, BPB Publications, 2014.

ReferenceBooks:

1. “IntroductiontoComputers”, PeterNorton
2. ComputersToday,D.H.Sanders,McGrawHill.
3. “Computers”,Larrylong&NancyLong,Twelfthedition,PrenticeHall.
4. ProblemSolvingCasesinMicrosoftExcel,JosephBrady&EllenFMonk,ThomsonLearning

EBooks/Onlinelearningmaterial

1. www.sakshat.ac.in
2. <https://swayam.gov.in/course/4067-computer-fundamentals>

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:**BVHN105-18**

CourseName:**PCHardware Laboratory**

Program: B.Voc	L:0 T:0 P:3
Branch:Hardware &Networking	Credits:1.5
Semester:I	
Theory/Laboratory: Laboratory	Percentageofnumerical/designproblems:--
Internalmax.marks:30	Durationofendsemesterexam(ESE):--
Externalmax.marks: 20	Electivestatus:core
Totalmarks:50	

Task1:	Assemblingand DeAssemblingof Computer System
Task2:	LoadingandconfigurationprocedureofMicrosoftClientO/SWinXP/Win7and Windows 8
Task3:	Installationofutilitytools (Softwareand Drivers)
Task4:	Firewallconfiguration,Antivirus/Internetsecurityloadingandconfiguration procedure
Task5:	Installationandconfigurationof,I/Odevices–Printers,Webcams,Scanners, Digital Camera , USB Wifi , USB BT, USB Storages , Projectors
Task6:	MultipleOS loadingandtrouble shooting

RecommendedHardware:

ScrapCPUs,ScrapPCCabinet,SMPSandotherbasiccomponents,ScrapMotherboardand Different Types of Processors, Scrap RAM, Desktop PC without loading OS, Scrap UPS, Laptop.

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:**BVHN106-18**

CourseName:**ComputerNetworkingLaboratory**

Program: B.Voc	L:0 T:0 P:3
Branch:Hardware &Networking	Credits:1.5
Semester:I	
Theory/Laboratory: Laboratory	Percentageofnumerical/designproblems:--
Internalmax.marks:30	Durationofendsemester exam (ESE):--
Externalmax.marks: 20	Electivestatus:core
Totalmarks:50	

Task1:	PreparingComputer Network Cable usingConnectors and Networkingtools
Task2:	LAN&WANConnectivityusing Hub, Switch andRouter
Task3:	InstallationofWindowsandServer
Task4:	SharingPeripheral Devices.
Task5:	ConfigurationofNetworkConnectivity
Task6:	Troubleshootingof ComputerHardwareand Network

RecommendedHardware:

SimpleNetworkComponents,NetworkingComponentslikeSwitch,Router,Hub,NIC, PC/Laptop, Router, Connectivity Network lab

CourseCode:**BVDW204-19**

CourseName: **Mathematics**

Program: B.Voc.	L: 3 T: 0 P: 0
Branch: Data&WebAnalytics	Credits: 3
Semester: 1st	Contacthours: 33
Theory/Laboratory: Theory	Status(Elective/Core): Core
Internalmax.marks: 40	Externalmax.marks: 60
Totalmarks: 100	

CourseOutcomes:

CO#	Courseoutcomes
CO1	Representdatausingvariousmathematicalnotions.

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CourseCode:**BVHN107-18**

CO2	Explaindifferenttermsused inbasic mathematics.
CO3	Describevariousoperationsandformulas usedtosolvemathematicalproblems.

DetailedContents	Contacthours
Unit-I SetIntroduction,Objectives,RepresentationofSets(RosterMethod,SetBuilderMethod),TypesofSets(NullSet,SingletonSet,FiniteSet,InfiniteSet,Equal Set, Equivalent Set, Disjoint Set, Subset, Proper Subset, Power Set,UniversalSet)andOperationwithSets(UnionofSet,IntersectionofSet, Difference of Set, Symmetric Difference of Set) Universal Sets, Complementof aSet.	9
Unit-II LogicStatement,Connectives,BasicLogicOperations(Conjunction,Disjunction, Negation)LogicalEquivalence/EquivalentStatements,Tautologiesand Contradictions.	8
Unit-III MatricesIntroduction,TypesofMatrix(RowMatrix,ColumnMatrix,Rectangular Matrix,SquareMatrix,DiagonalMatrix,ScalarMatrix,UnitMatrix,NullMatrix,ComparableMatrix,EqualMatrix),ScalarMultiplication, NegativeofMatrix,AdditionofMatrix,DifferenceoftwoMatrix,Multiplicationof Matrices, Transpose of aMatrix.	11
Unit-IV Progressions Introduction, Arithmetic Progression, Sum of Finite number ofquantitiesinA.P,ArithmeticMeans,GeometricProgression,GeometricMean.	11

TextBooks:

1. DiscreteMathematicsandIts ApplicationsbyKennethH. Rosen,McGrawHill, 6thEdition.
2. CollegeMathematics,Schaum'sSeries,TMH.

ReferenceBooks:

1. ElementaryMathematics,Dr.RDSharma.
2. ComprehensiveMathematics,Parmanand Gupta.
3. ElementsofMathematics,MLBhargava.

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode: **BVHN201-18**

CourseName:**DATABASEMANAGEMENTSYSTEMS**

Program:B.Voc	L:3 T:1 P:0
Branch:Hardware &Networking	Credits:4
Semester:2 nd	Contacthours:44
Theory/Laboratory: Theory	Electivestatus:core
Internalmax.marks:40	
Externalmax. marks:60	
Totalmarks:100	

Course Outcomes:

CO#	Course outcomes
CO1	Understandthebasicconceptsof DBMS.
CO2	Formulate,usingSQL,solutions toabroad range ofqueryand data update problems.
CO3	Demonstrateanunderstanding ofnormalizationtheoryandappliesuchknowledgeto thenormalization ofadatabase.
CO4	Understandthe conceptof TransactionandQueryprocessingin DBMS.

DetailedContents	Contact hours
Unit-I Introduction of DBMS, Data Modeling for a Database, Three level Architectureof 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
Unit-II Relational Database, Relational Algebra and Calculus, SQL Fundamentals, DDL, DML,DCL,PL/SQLConcepts,Cursors,StoredProcedures,StoredFunctions, DatabaseTriggers.	11
Unit-III Introduction to Normalization, First, Second, Third Normal Forms, Dependency Preservation, Boyce-Codd Normal Form, Multi-valued Dependencies and Fourth NormalForm,JoinDependenciesandFifthNormalForm,Domain-keynormal form(DKNF).	11
Unit-IV Database Recovery, Concurrency Management, Database Security, Integrity and Control. Structure of a Distributed Database, Design of Distributed Databases.	11

Text Books:

1. "AnIntroductiontoDatabaseSystem",BipinC.Desai,GalgotiaPublicationsPvtLtd-New Delhi, Revised Edition, (2012).
2. "AnIntroductiontoDatabaseSystems",C.J.Date,A.Kannan,S.Swamynathan,8th Edition, Pearson Education, (2006).

ReferenceBooks:

1. "SQL, PL/SQLThe Programming Language of Oracle", Ivan Bayross, BPBPublications, 4th Revised Edition (2009)
2. "DatabaseSystemConcepts",AbrahamSilberschatz,HenryF.Korth,S.Sudharshan, Tata McGraw Hill, 6th Edition, (2013).
3. DatabaseManagementSystems,RaghuRamakrishnan,McGraw-Hill,ThirdEdition,2014.

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode: **BVHN201-18**

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode: **BVHN202-18**

CourseName: **Programmingin Java**

Program:B.Voc	L:3 T:1 P:0
Branch:Hardware&Networking	Credits:4
Semester:2 nd	Contacthours:44
Theory/Laboratory: Theory	Electivestatus:core
Internalmax.marks:40	
Externalmax.marks:60	
Totalmarks:100	

Course Outcomes:

CO#	Course outcomes
CO1	FamiliarizationwiththeconceptofObjectOrientedconceptsbyimplementingJava Programming.
CO2	Learntheconceptsofclasses&objectswiththefeaturesofreusabilityandimplementationof thesamewithvariouscontrolstructurestosolvearealworldproblems.
CO3	Understandanddesignbuilt-inanduserdefinedfunctions/methods,interfacesandpackages etc.
CO4	Abletohandlevarioustypesofdatausingarrays&stringsandhandlingofexceptions occurred in programs.
CO5	UtilizemultithreadingandappletfeaturesofJavaforefficientandeffectiveprogramming.
CO6	Createandhandlefilesin Java.

DetailedContents	Contact hours
Unit-I Java Programming Fundamentals: Introduction to Java, Stage for Java, Origin,ChallengesofJava,JavaFeatures,JavaProgramDevelopment,Object Oriented Programming. JavaEssentials: ElementsofJavaProgram,JavaAPI, Variables and Literals, Primitive Data Types, The String class, Variables, Constants, Operators, Scope of Variables & Blocks, Types of Comment in Java.	11
Unit-II Control Statements: 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). Classes and Objects: Basic concepts of OOPS, Classes and Objects, Modifiers, Passing arguments, Constructors, Overloaded Constructors, Overloaded Operators, Static Class Members, Garbage Collection. Inheritance: Basics of inheritance, Inheriting and Overriding Superclass methods, Calling Superclass Constructor, Polymorphism, Abstract Classes, Final Class.	11

Unit-III Arrays and Strings: 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. Interface and Packages: Basics of interface, Multiple Interfaces, Multiple Inheritance Using Interface, Multilevel Interface, Packages, Create and Access Packages, Static Import and Package Class, Access Specifiers. Exception Handling: Introduction, Try and Catch Blocks, Multiple Catch, Nested Try, Finally, Throw Statement, Built-In Exceptions.	11
Unit-IV Multithreading: Introduction, Threads in Java, Thread Creation, Lifecycle of Thread, Joining a Thread, Thread Scheduler, Thread Priority, Thread Synchronization. Applets: Introduction, Applet Class, Applet Life Cycle, Graphics in Applet, Event-Handling. File and I/O Streams: File Class, Streams, Byte Streams, Filtered Byte Streams, Random Access File Class, Character Streams.	11

Text Books:

1. Programming with Java A Primer, 5th 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, 7th Edition, TMH.

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:**BVHN203-18**

CourseName:**Project- 1**

Program: B.Voc	L:0 T:0 P:8
Branch:Hardware &Networking	Credits:4
Semester:2 nd	
Theory/Laboratory: Laboratory	Percentageofnumerical/designproblems:--
Internalmax.marks:60	Durationofendsemester exam (ESE):--
Externalmax. marks:40	Electivestatus:core/ elective
Totalmarks:100	

StartingofMajorProjectnamedasMinorProject(FeasibilityStudy,RequirementAnalysisand Design)

ToolsforMinor Projects

Frontend	Java
Backend	SqlServerorOracleorMS Access

InMinorProjects2normalapplicationsandonedatabaserelatedapplicationismust

Note:Thebreakupof marksfortheExternalpracticalwillbeasunder

Viva Voce	15marks
SystemDevelopment	25 marks

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:**BVHN204-18**

CourseName:**Database Management Systems Laboratory**

Program: B.Voc	L:0 T:0 P:3
Branch:Hardware &Networking	Credits:1.5
Semester:2 nd	
Theory/Laboratory:Laboratory	Percentageofnumerical/designproblems:--
Internalmax.marks:30	Durationofendsemester exam (ESE):--
Externalmax. marks:20	Electivestatus:core/elective
Totalmarks:50	

Course Outcomes:

CO#	Courseoutcomes
CO1	Abletounderstandvarious queriesandtheir execution
CO2	Populateandquerya databaseusingSQLDML/DDI commands.
CO3	Declareandenforceintegrityconstraintsonadatabase
CO4	ProgrammingPL/SQLincludingstored procedures,stored functions,cursors, packages
CO5	Ableto design new databaseand modifyexisting onesfornew applications andreason about theefficiencyof the result

Instructions:

1.	UsedofCREATE,ALTER,RENAMEandDROPstatementinthedatabasetables (relations)
2.	UsedofINSERTINTO,DELETEandUPDATEstatementinthedatabasetables (relations)
3.	Useofsimpleselect statement.
4.	Useofselect queryontworelations
5.	Useof nestingof queries.
6.	Useofaggregate functions.
7.	Useofsubstring comparison.
8.	Useoforderbystatement.
9.	ConsiderthefollowingschemaforaLibrary Database: BOOK (<i>Book_id, Title, Publisher_Name, Pub_Year</i>) BOOK_AUTHORS (<i>Book_id, Author_Name</i>) PUBLISHER (<i>Name, Address, Phone</i>) BOOK_COPIES(<i>Book_id,Branch_id,No-of_Copies</i>) BOOK_LENDING(<i>Book_id,Branch_id,Card_No,Date_Out,Due_Date</i>) LIBRARY_BRANCH (<i>Branch_id, Branch_Name, Address</i>) Write SQLqueries to 1. Retrievedetailsofallbooksinthelibrary_id,title,nameofpublisher,authors, number of copies in each branch, etc. 2. Gettheparticularsofborrowerswhohaveborrowedmorethan3booksbetween Jan 2018 to Jun 2018 3. DeleteabookinBOOKtable.Update thecontentsofothertablestoreflectthis data

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	manipulation operation. 4. Partition the BOOK table based on year of publication. Demonstrate it working with a simple query. 5. Create a view of all books and its number of copies that are recurrently available in the Library.
10.	Consider the following schema for Order Database: SALESMAN(<i>Salesman_id</i> , <i>Name</i> , <i>City</i> , <i>Commission</i>) CUSTOMER (<i>Customer_id</i> , <i>Cust_Name</i> , <i>City</i> , <i>Grade</i> , <i>Salesman_id</i>) ORDERS(<i>Ord_No</i> , <i>Purchase_Amt</i> , <i>Ord_Date</i> , <i>Customer_id</i> , <i>Salesman_id</i>) Write SQL queries to 1. Count the customers with grades above Amritsar's average. 2. Find the name and numbers of all salesmen who had more than one customer. 3. List all salesmen and indicate those who have and don't have customers in their cities (Use UNION operation.) 4. Create a view that finds the salesman who has the customer with the highest order of a day. 5. Demonstrate the DELETE operation by removing salesman with id 1000. All his orders must also be deleted.
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 a 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).

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:**BVHN205-18**

CourseName:**Programmingin JavaLaboratory**

Program: B.Voc	L:0 T:0 P:3
Branch:Hardware &Networking	Credits:1.5
Semester:2 nd	Contact hours:
Theory/Laboratory: Laboratory	Percentageofnumerical/designproblems:--
Internalmax.marks:30	Durationofendsemester exam (ESE):--
Externalmax. marks:20	Electivestatus:core/ elective
Totalmarks:50	

CourseOutcomes:Willnurturetheprogrammingskillsofthestudents.Studentswillbeable to develop interest in designing projects/software.

CO#	Course Outcomes
CO1	ImplementCoreJava concepts.
CO2	Solvecomputationalproblems usingvarious operatorsofJava.
CO3	Designsolutions to complexbyhandlingexceptions that mayoccurin theprograms.
CO4	Solvecomplexandlarge problemsusingtheconceptofmultithreading.
CO5	Implementinterfacesanddesign packages.

Instructions:AllprogramsaretobedevelopedinJavaprogramming language.

1.	Writeaprogram to performfollowingoperationson twonumbers input bythe user: 1)Addition2)subtraction3)multiplication4)division
2.	WriteaJavaprogram toprintresult ofthefollowingoperations. 1. -15+58* 45 2. (35+8)%6 3. 24+-5*3 / 7 4. 15 +18 / 3 * 2-9 % 3
3.	WriteaJavaprogramto computeareaof: 1)Circle2)rectangle3)triangle4) square
4.	Writeaprogramto converttemperaturefromFahrenheit toCelsiusdegreeusing Java.
5.	WriteaprogramthroughJavathatreads anumber ininches, convertsitto meters.
6.	Writeaprogramto convert minutesintoanumberofyearsand days.
7.	WriteaJavaprogramthat printscurrent timein GMT.
8.	DesignaprograminJavatosolvequadraticequations usingif,if else
9.	WriteaJavaprogramto determine greatestnumberofthreenumbers.
10.	Writeprogramthatgetsanumberfromtheuserandgeneratesanintegerbetween1 and7 subsequentlyshould displaythe nameof theweekdayas perthatnumber.
11.	ConstructaJavaprogramto findthenumberof days ina month.
12.	Writeaprogram tosum valuesofan SingleDimensional array.
13.	Design& executeaprogram inJavato sortanumeric arrayandastringarray.
14.	Calculatetheaveragevalueof arrayelements through JavaProgram.
15.	WriteaJavaprogramto test ifan arraycontainsaspecificvalue.

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16.	Findtheindex of an arrayelementbywriting aprogram in Java.
17.	WriteaJavaprogramto removeaspecific element from an array.
18.	Design aprogram to copyanarraybyiteratingthe array.
19.	WriteaJavaprogram toinsert an element(on aspecific position) into Multidimensional array.
20.	Writeaprogramto perform followingoperationson strings: 1) Comparetwostrings. 2) Count stringlength. 3) Convertuppercasetolowercase&vice versa. 4) Concatenatetwo strings. 5) Print asubstring.
21.	DevelopedProgram&designamethodtofind thesmallest numberamongthree numbers.
22.	Computethe averageof threenumbers through aJavaProgram.
23.	WriteaProgram&design amethod tocount all vowelsin astring.
24.	WriteaJavamethod to count all words in astring.
25.	Writeamethod in Javaprogram to count all words in a string.
26.	WriteaJavaprogram tohandlefollowing exceptions: 1) DividebyZero Exception. 2) ArrayIndexOut OfBbound Exception.
27.	Torepresenttheconceptof <i>Multithreading</i> writea Javaprogram.
28.	Torepresenttheconceptofalltypes ofinheritancesupportedbyJava,design a program.
29.	Writeaprogramtoimplement <i>MultipleInheritance</i> using interface.
30.	ConstructaprogramtodesignapackageinJava.
31.	Towrite andread aplaintext file, writeaJavaprogram.
32.	WriteaJavaprogram toappend texttoan existingfile.
33.	DesignaprograminJava to getalistofall file/directorynames fromthegiven.
34.	Develop a Javaprogramto check if a file or directoryspecifiedbypathname exists ornot.
35.	WriteaJavaprogramtocheckif afileordirectoryhasreadandwritepermission.

Text Books:

1. ProgrammingwithJavaA Primer,5th Edition,E.Balagurusamy,TMH.
2. JavaProgrammingforCoreandAdvancedLearners,Sagayaraja,Denis,Karthik, Gajalakshmi, Universities Press.
3. JavaFundamentals,AComprehensive Introduction,H.Schildt,D.Skrien, TMH.

ReferenceBooks:

1. Java,ThecompleteReference, H.Schildt, 7th Edition, TMH.
2. DataAnalyticsusingR,SeemaAcharya,TMH.

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B.Voc.(HardwareandNetworking),Batch-2018

Couse Code: EMC-101-25

CourseName: **Entrepreneurship Setup and Launch**

Introduction:

This semester lays the foundation for the learner to understand what entrepreneurship is, beyond just starting a business. It introduces key ideas like problem-solving, value creation, and self-awareness. The learner will begin exploring basic business concepts while discovering their own interests and strengths.

Learners Objective:

1. Understand the core concepts of entrepreneurship through relatable, real-life examples.
2. Begin to see themselves as problem-solvers and creators.
3. Learn about business paths and choose one to try based on interest or local fit.
4. Launch a micro-hustle (online or offline) to earn their first income.
5. Build confidence and self-belief by doing.

Outcome: By the end of this semester, learners will start a simple business activity, earn their first income, and build belief in their ability to do business.

Guiding Principles/Approach:

This syllabus is built on principles of **experiential learning, growth mindset development, and identity-first learning**. Drawing from learning science and behavior design, the course shifts students from passive learning to *active doing*, where they try out small business activities in real contexts. The design helps students not just learn entrepreneurship but begin to see themselves as entrepreneurs. Emphasis is placed on *small wins, peer collaboration, and locally relevant opportunities* to ensure learning feels achievable and connected to their realities. The curriculum focuses on conceptual understanding without heavy theory, combining *practical action, reflection, and collaboration*. *By making progress visible and success feel possible, it plants the seeds of self-reliance, initiative, and long-term motivation.*

SemesterSyllabus:

Format: 12weeks,4hours/week|2credits

RevenueTarget: ₹10,000

Week	Learning Goal	MeasurableOutcome
1	Understandwhatentrepreneurship isand who can be an entrepreneur	Studentsdefineentrepreneurshipintheir ownwordsandlist 2entrepreneursfrom theirlocalareaor community
2	Connectpersonalidentity to entrepreneurship(strengths, interests, struggles)	Studentscreatea“value map”showinghow askill/interest/problemfromtheirlifecould become a business opportunity
3	Learn about 5 business paths: contentcreation,drop-shipping, cloudkitchen/foodbusiness,gig economyand localservices	Students explore 1–2 examples from each domainandshareonethey’re mostcurious to try and why

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4	Choose a path and generate a basic business idea	Students write down a clear offer (what, for whom, why) and one way to reach their customer
5	Take first real action: message, post, pitch, or sell	Students reach out to serve 1 real potential customer and record what happened
6	Reflect on first attempt and share with peers	Students share their result, a challenge faced, and one idea to improve next time
7	Improve and try again: aim for first ₹100	Students apply a change, try again, and aim to make their first ₹100 or get meaningful response
8	Learn how to identify and understand your target customer	Students talk to 2 potential customers or observe them and list 3 insights about their needs
9	Learn how to serve your target audience better	Students improve one part of their offer (product, delivery, messaging, or interaction) based on customer feedback or need
10	Explore core entrepreneurial values (resilience, honesty, effort)	Students reflect on 1 value they're building and show it in a business task or peer story
11	Focus on earning and staying consistent	Students complete a second earning task and track their consistency (e.g., same product or message for 3 days)
12	Reflect on earnings, grit, and how to keep going	Students record total earnings, one resilience moment, and one support system or habit they'll continue with

Weekly Component:

Component	Duration	Description
Learning Module	~1.5hrs	- Introduces key concepts in a simple and engaging way - Includes examples, and 1–2 interactive discussions or quizzes
Action Lab	~2hrs	- Hands-on task on the weekly concept - Includes step-by-step guidance, templates, and worksheets - Ends with a submission (e.g., video, reflection, or proof of action)
Resources	Self-paced	- Supplementary videos, short readings, real-life stories, and tools to deepen understanding at their own pace

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EvaluationCriteria

Evaluation Component	Description	Weightage
WeeklyTask Completion	Timelysubmissionofweeklytasksincluding reflections,activities,quizzesetc.	40%
Target Completion	Performance-basedevaluationonhitting revenueor profittargets (e.g.,generating₹10,000revenue)	30%
FinalProject	Acomprehensiveprojectbasedonthe semester's theme	30%

Week1:WhatisEntrepreneurship?WhoCanBeanentrepreneur?

INTRODUCTION:CouldYouBeanentrepreneur?

When people hear “entrepreneur,” they often think it means having a company, investors, or an MBA. Some even believe it's only for toppers or those with high grades. But entrepreneurship is more about mindset than qualifications: it's about seeing a problem and doing something about it. Like someone who starts selling snacks because their school canteen is always shut, or a friend who fixes broken chargers for others. If you've ever spotted a need and thought, “I can solve this,” - you've already taken your first step.

Component1:LearningModule(~1.5hours)Unit1:

Whatis Entrepreneurship?

1. *Solving problems or creating value in exchange for money.*
2. Entrepreneurship is not just about starting a company: it's about initiative, resourcefulness, and value creation.
3. Different types of entrepreneurs: small shop owners, street vendors, YouTubers, local tailors, mechanics, and more.
4. Entrepreneurs build opportunities instead of waiting for them.

SimpleSlide/VisualAidTip:

A circle that says "Problem", an arrow pointing to "Solution", then an arrow to "Earn".
That's entrepreneurship.

<A video that visually shows how entrepreneurship starts with spotting a problem (e.g., long food lines), creating a solution (e.g., pre-order lunch service), and earning from it: illustrating the simple flow: Problem → Solution → Earn>

MCQ1

Q:What best describes entrepreneurship?

- A. Getting a job in a company
- B. Solving problems for others and earning from it 
- C. Studying business in college
- D. Buying expensive things

Feedback:

1. *Correct! Entrepreneurs solve problems or offer value and get paid for it.*
2. *Not quite! Entrepreneurship is about creating something useful, not just getting a job or studying.*

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Unit2:WhoCanBeanentrepreneur?

Entrepreneurshipstartswithspottingaproblem,findingasolution,andcreatingvalue.Today,anyonewithaphoneandaninternetconnectioncanstartabusiness;moneyhelps,butmindset and initiative matter more at the start.

Youjust need:

1. Aproblemptosolve
2. Asimpleskillorproduct
3. Thecouragetostartsmall

ExamplesCarousel(Swipeablecards)

1. **Pooja(India)**–Sells handmaderakhisonInstagram,learneddesigningonYouTube.
Problemshesaw:Expensiveorgenericrakhisinthemarket;nopersonal touch.
2. **Luis(Mexico)**–Repairsusedphonesinhisgarage,nowhasloyal customers.
Problemshesaw:Manypeoplecouldn'taffordnewphonesordidn'ttrustlocalrepair shops.
3. **Sana(Kolkata)**–Startedtiffindeliveryfromherhomekitchen,nowearns₹500/day.
Problemshesaw:Officeworkersstruggledtofindaffordable,homemade meals.
4. **Sal Khan (USA)** – Started Khan Academy with YouTube lessons to help his cousin.
Problemshesaw:His cousinneededhelpwithmath,butgoodlearningresourceswere hard to access.

MCQ

Q:Whichofthesecanbe aformofentrepreneurship?

- A. Makingreelssonskincaretipsandsellinghomemadefacepacks 
- B. Buyingnewclothesfrommalls
- C. Studyingengineering
- D. Playinggameswithoutsharingorstreaming

Feedback:

1. *Correct!Sharingusefultips+sellingaproduct=solvinganeed!*
2. *Tryagain!Entrepreneurshipisaboutcreating valueandhelping others.*

ReflectionPrompt

1. Ifyouhadtoearn₹100thisweek,whatwouldyou do?

Component 2:Action Lab (~2 hours) Task

Find&Learnfrom2EntrepreneursNearYou

Steps(Checklist):

1. Lookaroundyourneighborhoodoronline:find2peoplewhoearnthroughtheirownwork
2. Askorobserve:
 - a) Whatdotheydo?
 - b) Howdothey earn?

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- c) Whatmakesthementrepreneurial?
3. Usethe**EntrepreneurTrackerTemplate**(availableintheresourcestab)

FinalDeliverable

Learnersubmits:

1. Ashortdefinitionofentrepreneurship(intheirwords)
2. 2entriesfromtheEntrepreneurTracker(name,whattheydo,what learner learned)

→Submittedinthesubmissionstab.

SupplementaryResources(Optional)

1. [DannyO'Neill-Gettingstarted|Entrepreneurship|KhanAcademy](#)
2. [TheBetterIndia–Storiesoflocalentrepreneurs](#)

Week2:CanIBeanentrepreneur?

INTRO–WhatMakesanentrepreneur?

You don't need a suit, a degree, or a lot of money to be an entrepreneur.

You need one thing: a mindset. Entrepreneurs notice problems around them: and do something about it. From the boy fixing bikes outside his house to the girl teaching dance on Instagram, they all started small. What matters most is not what you have: it's how you think and act.

Component1:LearningModule(~1.5hours) Unit

1: What Makes an entrepreneur?

Key Concepts:

1. **Entrepreneurs are driven by curiosity:** they ask questions, explore possibilities, and seek better ways to do things.
2. **They take initiative:** they act, experiment, and create using limited resources with creativity and courage
3. **They learn by doing:** embracing mistakes as stepping stones to progress.
4. **They take full ownership:** one day they're the marketer, the delivery person, and the customer support, all in one.
5. **They are resilient:** they persist through challenges, adapt to change, and keep moving forward with purpose.

Real-Life Examples:

1. Nithin & Nikhil Kamath (Zerodha) – Started India's largest stock brokerage without formal degrees or external funding, just deep curiosity about stock markets and a desire to simplify investing.
2. *Qualities: Took initiative early and stayed persistent through challenges.*
3. Prajakta Koli (Mostly Sane) – Started by making comedy sketches about everyday Indian life: family, school, relationships: and became one of India's top digital creators.
4. *Qualities: Stayed consistent, adapted over time, and built strong audience trust.*
5. Tilak Mehta (PapernParcels) – As a teenager, launched a courier startup using Mumbai's dabbawala network for delivery.
6. *Qualities: Thought creatively and acted with confidence at a young age.*

Unit2:StartSmall:BuildIdeasfromWhatYouKnow

In the last unit, you learned that entrepreneurs don't just have ideas; they act, solve problems, and use what they have.

But the big question now is:

“What can I offer?”

That's where the Value Map comes in. It helps you take your first step toward thinking and acting like an entrepreneur: in your own way.

What is a Value Map?

A Value Map connects three simple things:

A. What people around you need

→ *Look around: is there something people often struggle with or something that could be better?*

B. What you enjoy or are willing to try

→ *You don't need to be an expert. Start with small things you like doing: talking to people, fixing, organizing, helping, designing, or learning something new.*

→ *Even if you're just curious about something: that's enough to begin.*

C. What solution you can create

→ *Use what you enjoy or are learning to try solving a real need around you: even in a small way*

Visuals:

3 overlapping circles:

1. “People Need”
2. “I Can”
3. “My Offer”

Examples:

1. People Need → Affordable meals

I Can → Cook + have access to home kitchen My Offer → ₹40 tiffin service

2. People Need → Study tips in Punjabi I Can → Speak clearly + love teaching

My Offer → 3-minute video tip on Instagram

MCQ

Q: What's the first step to being an entrepreneur?

- A. Waiting for the perfect idea
- B. Solving a problem with your skills 
- C. Buying a shop
- D. Studying for years

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Feedback:

1. *Correct!Entrepreneursstartbysolvingsmallproblemsusing whattheyalreadyhave.*
2. *Tryagain!It'snotaboutwaiting:it'sabout starting.*

ReflectionPrompt

1. Ifsomeonegaveyou ₹500 andaskedyouto earnfromit, whatwould you do?

Component2:ActionLab(~2 hours)

Task:CreateYourPersonalValueMapSteps(checklistin app):

1. Thinkof2–3problemspeoplefacearoundyou(hunger,phonerepair,boredom,etc.)
2. Listyourownskills,interests,orresources.
3. Matcheachproblemwithsomethingyoucouldoffer.
4. Usethe**ValueMapTemplate**intheresourcestoorganizeyourideas.

FinalDeliverable(SubmittedinApp):

1. Yourcompleted**ValueMap**(in3columns:Need,Skill,Offer)
2. Highlight**1idea**you'dliketoexploreforyourfuturehustle

SupplementaryResources(Optional)

1. "StartwithWhy"bySimonSinek
2. [10CharacteristicsofSuccessful Entrepreneurs|Business:Explained](#)

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:**BVHN301-18**

CourseName:**Data warehousing and Mining**

Program: B.Voc	L:3 T:0 P:0
Branch:Hardware &Networking	Credits:3
Semester: III	Contacthours:33
Theory/Laboratory:Theory	Electivestatus:core
Internalmax.marks:40	
Externalmax.marks: 60	
Totalmarks:100	

Detailedcontents	Contact hours
Unit 1: 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
Unit 2: 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
Unit 3: Association Rule Mining, Market Basket Analysis, Apriori Algorithm, Mining Multi level Association Rules, Introduction to Classification, Classification by decision Tree, Attribute Selection Measure.	8
Unit 4: Introduction to Prediction techniques, Accuracy of a Classifier, Cross-Validation, Bootstrap,Boosting,Bagging, IntroductiontoClustering,ClassificationofVarious Clustering Algorithms, Data Visualization.	8

SuggestedReadings

1. DataWarehousing,DataMining,andOLAP,AlexBerson,FirstEdition,TataMcGrawHill
2. DataMiningConcepts&Techniques,JiaweiHan&MichelineKamber,SecondEdition, Morgan Kaufmann Publishers
3. ModernDataWarehousing,Mining&VisualizationCoreConcepts,GeorgeMMarakas,First Edition, Pearson Education
4. DataWarehousing,Architecture&Implementation,Hawkin,PrenticeHall
5. Data Mining: Modeling Data for Marketing, Risk and Customer Relationship Mgmt, Rud, Olivia, Paperback Edition.
6. DataMiningTechniques,Berry,Michael,ThirdEdition
7. DataMining,DataWarehousingandOLAP,Sharma,Gajendra,Second Edition
8. DataMiningwithCaseStudies,GuptaGK,SecondEdition
9. PrinciplesofDataMining,Hand,David.

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:**BVHN302-18**

CourseName: **ProblemSolvingusingC**

Program:B.Voc	L:3 T:0 P:0
Branch:Hardware &Networking	Credits:3
Semester: III	Contacthours:33
Theory/Laboratory: Theory	Electivestatus:core
Internalmax.marks:40	
Externalmax. marks:60	
Totalmarks:100	

Detailedcontents	Contact hours
Unit 1: Logic Development: Flowcharts and algorithms. Fundamentals: Character set, Identifiers and Key Words, Data types, Constants, Variables, Expressions, Statements, Symbolic Constants. Operations and Expressions: Arithmetic operators, Unary operators, Relational Operators, Logical Operators, Assignment and Conditional Operators, Library functions.	8
Unit2: Control Statements: While, Do-while and For statements, Nested loops, If- else, Switch, Break – Continue statements.	8
Unit3: Functions: defining Function, accessing functions, passing arguments to function, specifying argument data types, function prototypes Arrays: Defining, processing arrays, passing arrays to a function, multi- dimensional arrays.	8
Unit4: Structures & Unions: Defining and processing a structure, user defined data types, structures and pointers, passing structures to functions, unions. Pointers: 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.

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode: **BVHN 303-18**

CourseName:**HumanValues&Professional Ethics**

Program:Hardwareand Networking	L:3 T:0 P: 0
Branch:B.Voc	Credits:3
Semester:III	Contact hours:33
Theory/Laboratory:Theory	Electivestatus:core
Internalmax.marks: 40	
Externalmax.marks:60	
Totalmarks:100	

Detailed contents	Contact hours
Unit1-1 CourseIntroduction-Need,BasicGuidelines,ContentandProcessfor Value Education 1. Understandingtheneed,basicguidelines,contentandprocessforValueEducation 2. Self–Exploration–whatisit?itscontentandprocess;‘NaturalAcceptance’and Experiential Validation as the mechanism for self exploration 3. ContinuousHappinessandProsperity-AlookatbasicHuman Aspirations 4. Rightunderstanding,RelationshipandPhysicalFacilities -thebasicrequirementsfor fulfillment of aspirations of every human being with their correct priority 5. UnderstandingHappinessandProsperitycorrectly -Acriticalappraisalofthecurrent scenario 6. Methodtofulfilltheabovehumanaspirations:understandingandlivinginharmonyat various leves	9
Unit-2 UnderstandingHarmonyintheHumanBeing-HarmonyinMyself! 1. Understandinghumanbeingasaco -existenceofthesentient‘I’andthematerial ‘Body’ 2. UnderstandingtheneedsofSelf(‘I’)and‘Body’-SukhandSuvidha 3. UnderstandingtheBodyasaninstrumentof‘I’(Ibeingthedoer,seerandenjoyer) 4. Understandingthecharacteristicsandactivitiesof‘I’andharmonyin‘I’ 5. UnderstandingtheharmonyofIwiththeBody:SanyamandSwasthya;correctappraisal of Physical needs, meaning of Prosperity in detail 6. ProgramstoensureSanyamandSwasthya-PracticeExercisesandCaseStudieswillbe taken up in Practice Sessions.	8
Unit-3 UnderstandingHarmonyintheFamilyandSociety-HarmonyinHuman-Human Relationship 1. UnderstandingharmonyintheFamily-thebasicunitofhumaninteraction 2. Understanding values in human - human relationship; meaning of Nyaya and program foritsfulfillmenttoensureUbhay -tripti;Trust(Vishwas) andRespect(Samman) asthe foundational values of relationship. 3. UnderstandingthmeaningofVishwas;Differencebetweenintentionandcompetence 4. UnderstandingthmeaningofSamman,Differencebetweenrespectanddifferentiation; the other salient values in relationship. 5. Understandingtheharmonyinthesociety(societybeinganextensionoffamily): Samadhan, Samridhi, Abhay, Sah - astitva as comprehensive Human Goals 6. Visualizing a universal harmonious order in society - Undivided Society (Akhand Samaj),UniversalOrder(SarvabhaumVyawastha) -fromfamilytoworldfamily!- PracticeExercisesandCaseStudieswillbetakenupinPractice Sessions.	8

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Unit-4 UnderstandingHarmonyintheNatureandExistence-WholeexistenceasCo-existence 1. Understandingtheharmonyinthe Nature 2. Interconnectednessandmutualfulfillmentamongthefourordersofnature recyclability and self - regulation in nature 3. UnderstandingExistenceasCo-existence(Sah-astitva)ofmutuallyinteractingunits in all - pervasive space 4. Holisticperceptionofharmonyatalllevelsofexistence-PracticeExercisesandCase Studies will be taken up in Practice Sessions.	8
ImplicationsoftheaboveHolisticUnderstandingofHarmonyonProfessionalEthics 1. Naturalacceptanceofhumanvalues. 2. DefinitivenessofEthicalHumanConduct 3. BasisforHumanisticEducation,HumanisticConstitutionandHumanisticUniversal Order 4. Competenceinprofessionalethics: a) Abilitytoutilizetheprofessionalcompetenceforaugmentinguniversalhuman order, b) Abilitytoidentifythescopeandcharacteristics ofpeople-friendlyandeco- friendly production systems, c) Abilitytoidentifyanddevelopappropriatetechnologiesandmanagementpatterns for above production systems. 5. Casestudiesoftypicalholistictechnologies,managementmodelsandproduction systems 6. StrategyfortransitionfromthepresentstatetoUniversalHumanOrder: a) Atthelevelofindividual:associallyandecologicallyresponsibleengineers, technologists and managers b) Atthelevelofsociety:asmutuallyenrichinginstitutionsandorganizations	

TextBook

1. RRGaur,RSangal,GPBagaria,2009,AFoundationCourseinValueEducation.

ReferenceBooks

1. IvanIllich,1974,Energy&Equity,TheTrinityPress,Worcester,andHarperCollins,USA.
2. E.F.Schumacher,1973,SmallisBeautiful:astudyofeconomicsasifpeoplemattered,Blond& Briggs,
Britain.
3. ANagraj,1998,JeevanVidyaekParichay,DivyaPathSansthan, Amarkantak.
4. SussanGeorge,1976,HowtheOtherHalfDies,PenguinPress.Reprinted1986,1991.
5. PLDhar,RRGaur,1990,ScienceandHumanism,CommonwealthPublishers.
6. A.N.Tripathy,2003,HumanValues,NewAgeInternationalPublishers.
7. SubhasPalekar,2000,HowtopracticeNaturalFarming,Pracheen (Vaidik)KrishiTantraShodh,
Amravati.
8. DonellaH.Meadows,DennisL.Meadows,JorgenRanders,WilliamW.BehrensIII,1972,Limits to
Growth – Club of Rome’s report, Universe Books.
9. EGSeebauer&RobertL.Berry,2000,FundamentalsofEthicsforScientists&Engineers,Oxford
University Press
10. MGovindrajran,SNatrajan&V.S.SenthilKumar,EngineeringEthics(includingHuman
Values), Eastern Economy Edition, Prentice Hall of India Ltd.
11. BPBanerjee,2005,FoundationsofEthicsandManagement, Excel Books.
12. BLBajpai,2004,IndianEthosandModernManagement,NewRoyalBookCo.,Lucknow.
Reprinted 2008.

RelevantCDs,Movies, Documentaries&Other Literature:

1. ValueEducationwebsite,<http://uhv.ac.in>
2. StoryofStuff,<http://www.storyofstuff.com>
3. AlGore,AnInconvenientTruth,ParamountClassics,USA
4. CharlieChaplin,ModernTimes,UnitedArtists,USA
5. IITDelhi,ModernTechnology–theUntoldStory

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode: **BVHN304-18**

CourseName:**Managementinformation System**

Program: B.Voc	L:3 T: 0 P: 0
Branch:Hardware &Networking	Credits:3
Semester:III	Contacthours:33
Theory/Laboratory: Theory	Electivestatus:core/elective
Internalmax.marks:40	
Externalmax. marks:60	
Totalmarks:100	

Detailedcontents	Contact hours
Unit 1: 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 IntroductiontodifferentkindsofInformationSystems:ESS,EIS,DSS,MIS, KWS,TPS, OASand EDP.	9
Unit 2: An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Robert Anthony'sHierarchyofManagementActivity,StructuredVsUnstructured Decisions,FormalVs. InformalSystems,PitfallsinMISDevelopment.	8
Unit 3: Simon's Model of Decision Making. DSS: Concept, Characteristics and Components, Gorry & Scott Morton Grid, Introduction to GDSS. Developing InformationSystems:Analysis&DesignofInformationSystems:Implementation & Evaluation.	8
Unit4: FunctionalMIS:ASTudyofMarketing,Personnel,Financialand Production MIS.	8

Suggested Books:

1. ManagementInformationSystems,Goyal,D.P.,ThirdEdition,Macmillan.
2. ManagementInformationSystems,Oz,Effy,ThomsonPressIndianEdition.
3. "ManagementInformationSystems",Kanter,J.,ThirdEdition,PHI.
4. "ManagementInformationSystems",Davis,GordanB.&Olson,M.H,SecondEdition
5. "Information Systems for Modern Management", Murdick, RobertG., &Ross, JoelE., & Claggett, James R., Third Edition, PHI.
6. "Analysis,Design&ImplementationofInformationSystem",Lucas,FourthEdition
7. ManagementInformationSystems,LaudonK.C.,EleventhEdition,Pearson

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode: **BVHN305-18**

CourseName:**ProblemSolvingusingC Laboratory**

Program: B.Voc	L:0 T:0 P:3
Branch:Hardware &Networking	Credits:1.5
Semester:III	
Theory/Laboratory:Laboratory	Percentageofnumerical/designproblems:--
Internalmax. marks:30	Durationofendsemester exam (ESE):--
Externalmax. marks:20	Electivestatus:core/elective
Totalmarks:50	

Instructions:Developallprograms inCprogramming language.

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

ReferenceBooks:

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.

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode: **BVHN306-18**

CourseName:**WorkshoponDesktopPublishing Laboratory**

Program: B.Voc	L:0 T:0 P:3
Branch:Hardware&Networking	Credits:1.5
Semester:III	
Theory/Laboratory: Laboratory	Percentageofnumerical/designproblems:--
Internalmax.marks:30	Durationofendsemester exam (ESE):--
Externalmax. marks:20	Electivestatus:core/ elective
Totalmarks:50	

Instructions:Instructorcanincrease/decreasethe experimentsaspertherequirement.

Assignments:

1	Design andprintaTitle Pageofa Magazine/Book.
2	Preparemultiple designsfora Flexbyusingdifferent Tools.
3	PrepareNSS Certificates forappreciationusinglogosofUniversity,College&NSS unit.
4	Prepare5differentDesigningof Business Cards.
5	PrepareEnvelops displayingfull address of the companybyinserting graphical symbol/logosofcompany.
6	Design andPrint Invoicesforthree companies.
7	PrepareandprintNewsLetter Layoutsforanyfiveactivitiesofyourcollege/ university.
8	PrepareInvitationCards forculturalmeetheldinyour college
9	Design andprintBrochurestoadvertisea“BloodDonationCamp”inyour college.
10	DesignLogosofyour college,University&Govt.ofPunjab alsodisplaytheselogos onblackbackgroundaswatermark.
11	Design,PrintandPublish5motivationsPlaycards.
12	Design&Print assignmentbookof minimum20PagesananyTopic.
13	Design&Printanyfive mostimportantactivitiesof yourcollegeina collage.
14	Design&PrintQuestionPaperofanySubject.
15	Assembleallthe latestnews cuttingofyour activitiesona10X 8sizeflex.

ReferenceBooks:

1. DTPCourse,byShirishChavan published byRapidex.
2. DTPCourseKitbyVikasGuptapublished by Comdex.
3. CorelDraw9 byDavidKarlinpublished byTechmedia.
4. AdobeIllustrator CCbyBrian WoodpublishedbyAdobePress.
5. PageMaker in EasySteps-Scott Basham.

SoftwareTools:

1. AdobeIllustrator14.
2. CorelDrawGraphicsSuit.
3. GNUimagemanipulation program.
4. InkScape.
5. PhotoScape Setup.
6. PM701.

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode: **BVHN 401-18**

CourseName:**InformationSecurity**

Program:B.Voc	L:3 T:0 P:0
Branch:Hardware& Networking	Credits:3
Semester:IV	Contacthours:33
Theory/Laboratory: Theory	Electivestatus:core
Internalmax.marks:40	
Externalmax. marks:60	
Totalmarks:100	

Detailedcontents	Contact hours
Unit 1 : Information Security Concepts : Information Security Overview: Background and Current Scenario, Principles of Security- Information Classification, Policy Framework, Role based Security in an organization, ComponentsofInformationSystems,BalancingInformationSecurityandAccess, Approaches to information Security Implementation, Security Systems DevelopmentLifeCycle.	9
Unit 2 : 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,SSLandSET,DatabaseSecurity.Firewalls-Overview,Design principlesandTypes.	8
Unit 3 : SecurityManagement and Laws: Introduction to SecurityManagement, Access Control and Intrusion Detection, Overview of Identification and Authorization, Intrusion Detection Systems And Intrusion Prevention Systems, SecurityProceduresandGuidelines,BusinessEthicsandBestPractices,Security Assurance,SecurityLaws,IPR, InternationalSecurityStandards,SecurityAudit, SSE-CMM/COBIT etc.	8
Unit 4 : Cryptography: Concepts and Techniques, Symmetric and Asymmetric KeyCryptography,Steganography,SymmetricKeyCiphers-DES,AES(Structure andAnalysis).Asymmetric KeyCiphers-PrinciplesofPublicKeycryptosystems, RSAAlgorithmmanditsAnalysis.Digital Signatures.	8

SuggestedBooks:

- 1)IntroductiontoInformationSecurityandCyberLawsPaperback-bySuryaPrakashTripathi (Author),RitendraGoel(Author),PraveenKumarShukla(Author)
- 2)PrinciplesofInformationSecurity.Paperback-byWhitman(Author)
- 3)CryptographyandInformationSecurityPaperback–byPachghareV.K.(Author)

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode: **BVHN 402-18**

CourseName:**SoftwareEngineering**

Program:B.Voc	L:3 T:0 P:0
Branch:Hardware& Networking	Credits:3
Semester: IV	Contacthours:33
Theory/Laboratory: Theory	Electivestatus:core
Internalmax.marks:40	
Externalmax. marks:60	
Totalmarks:100	

Detailedcontents	Contact hours
Unit 1 : Software:Characteristics,ComponentsApplications,SoftwareProcessModels:Waterfall,Spiral, Prototyping,FourthGenerationTechniques,ConceptsofProjectManagement,Role OfMetricsAnd Measurement.	9
Unit 2 : S/W Project Planning: Objectives, Decomposition Techniques: S/W Sizing, ProblemBasedEstimation,ProcessBasedEstimation,CostEstimationModels: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,ProceduralDesign,Object –OrientedConcepts.	8
Unit3: TestingFundamentals:Objectives,Principles,Testability,TestCaseDesign: White Box & Black Box testing, Testing Strategies: Verification & Validation, Unit Testing, Integration Testing, Validation Testing, System Testing.	8
Unit4: Advanced topicsin Software Engineering: Reengineering:Reverse Engineering,Restructuring, ForwardEngineering. ComputerAidedSoftwareEngineering(CASE):TaxonomyofCASEtools.	8

SuggestedBooks:

1. RogerS.Pressman,“SoftwareEngineering–APractitioner’sApproach“,SixthEdition, McGraw Hill
2. R.E.Fairley,“SoftwareEngineeringConcepts”,Paperback Edition,McGrawHill.
3. Jalota,“AnIntegratedApproachtoSoftwareEngineering”,ThirdEdition,Narosa Publishing House

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode: **BVHN 403-18**

CourseName: **ObjectOrientedProgrammingusingC++**

Program: B.Voc	L:3 T:0 P:0
Branch:Hardware &Networking	Credits:3
Semester:IV	Contacthours:33
Theory/Laboratory:Theory	Electivestatus:core
Internalmax.marks:60	
Externalmax. marks:40	
Totalmarks:100	

Detailedcontents	Contact hours
Unit1:Principlesofobjectorientedprogramming Introduction to OOP and its basic features, Basic components of a C++, Program and programstructure,CompilingandExecutingC++Program.DifferencebetweenProcedure Oriented Language(C) and Object Oriented Language	9
Unit2:Classes &ObjectsandConcept of Constructors Defining classes, Defining member functions, Declaration of objects to class, Access to member variables from objects, Different forms of member functions, Access specifiers (Private,public,protected),Arrayofobjects.Introductiontoconstructorsand destructors	8
Unit 3 : Inheritance IntroductiontoInheritance,Typesofinheritance:-Singleinheritance,Multiple inheritance,Multilevelinheritance,Hierarchicalinheritance,Hybrid inheritance	8
Unit4:FileHandling Introductionto file,OpeningandClosingFile,variousI/Ofunctionsusedinfile handling.	8

SuggestedBooks:

1. ObjectOrientedProgrammingwithC++,E.Balagurusami,FourthEdition,TataMc-GrawHill.
2. ObjectOrientedProgramminginTurboC++,RobertLafore,FourthEditionGalgotiaPublications.
3. TheC++ProgrammingLanguage,BjarnaStroustrup,ThirdEdition,AddisonWesleyPublishing Company.
4. ObjectOrientedProgrammingUsingC++,Salaria,R.S,FourthEdition,KhannaBookPublishing

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode: **BVHN 404-18**

CourseName: **ComputerSystemArchitecture**

Program: B.Voc	L:3 T:0 P:0
Branch:Hardware &Networking	Credits:3
Semester:IV	Contacthours:33
Theory/Laboratory: Laboratory	Electivestatus:core
Internalmax.marks:30	
Externalmax. marks:20	
Totalmarks:50	

Detailedcontents	Contact hours
Unit1 :LogicGates: AND, OR,NOT, NAND,NOR, XOR, XNOR,NAND&NOR as UniversalGates, LogicGatesApplications. Boolean Algebra: Introduction, Theorems, Simplification of Boolean Expression using BooleanAlgebra,SOP&POSForms,RealizationofBooleanExpressionusingGates,K- Maps, Simplification of Boolean Expression using K-Maps. .	9
Unit2:CombinationalLogicCircuits: HalfAdder&HalfSubtractor,FullAdder&Full Subtractor, Parallel Binary Adder, Binary Adder/Subtractor. CombinationalLogicCircuits: Multiplexers&Demultiplexers,Implementationof Boolean equations using Multiplexer and Demultiplexer, Encoders & Decoders.	8
Unit3:SequentialLogicCircuits: Latch,FlipFlops-R-SFlip-Flop,J-KFlip-Flop,Race Around Condition, Master-Slave JK Flip-Flop, D Flip-Flop, T Flip-Flop, Applications of Flip-Flops.	8
Unit 4 : Introduction to Computer Organization: Introduction to Computer and CPU (Computer Organization, Computer Design and Computer Architecture), Stored Program Concept- Von Neumann Architecture, RISC and CISC Architecture. Register Transfer and Micro operations- Introduction to Registers, Instruction Format, TypesofInstructions-MemoryReferenceInstructions,RegisterReferenceInstructionsand Input-Output Instructions. Common Bus System: Introduction to Common Bus System, Types of Buses (Data Bus, Control Bus, Address Bus), 16-bit Common Bus System--Data Movement among registers using Bus.	8

SuggestedBooks:

1. ComputerSystemArchitecture,M.M.Mano,ThirdEdition,PHI.
2. DigitalComputerElectronics,Malvino,SecondEdition,Mc-GrawHill.
3. ModernDigitalElectronics, R.P.Jain, FourthEdition, TMH.

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode: **BVHN 405-18**

CourseName:**ComputerSystemArchitectureLaboratory**

Program: B.Voc	L:0 T:0 P:3
Branch:Hardware &Networking	Credits:1.5
Semester:IV	
Theory/Laboratory: Laboratory	Percentageofnumerical/designproblems:--
Internalmax.marks:30	Durationofendsemester exam (ESE):--
Externalmax. marks:20	Electivestatus:core/ elective
Totalmarks:50	

Instructions:SampleexercisesaregivenbelowandInstructorcanincreaseordecreasethe experiments as per the requirement.

1	ToverifytheTruthTable ofBasicLogicGates
2	ToverifytheTruthTable ofCombinationalLogic Gates
3	ToverifytheTruthTable ofUniversalLogic Gates
4	Toverifythe TruthTableofHalf AdderCombinational Circuit
5	ToverifytheTruth Table of FullAdder Combinational Circuit
6	ToverifytheTruth Table of HalfSubtractor Combinational Circuit
7	ToverifytheTruth Table of FullSubtractor Combinational Circuit
8	Toverifythe TruthTable of MultiplexerCombinational Circuit
9	ToverifytheTruth Table of DeMultiplexer Combinational Circuit
10	Toverifythe TruthTable of S-RFlip-FlopandJ-K Flip-Flop
11	ToverifytheTruth Table ofAsynchronous counter
12	ToverifytheTruth Table of Synchronous counter

ReferenceBooks:

1. ComputerOrganizationandArchitecture,Stallings,EighthEdition,PHI.
2. ModernDigital Electronics,R.P.Jain, FourthEdition, TMH.
3. Digital Logic &ComputerDesign,D.MorrisMano,SecondEdition,PHI.
4. DigitalandElectronic Circuits,T.C.Bartee,McGrawHill.

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode: **BVHN 406-18**

CourseName:**ProblemSolvingusingC++ Laboratory**

Program: B.Voc	L:0 T:0 P:3
Branch:Hardware &Networking	Credits:1.5
Semester:III	
Theory/Laboratory:Laboratory	Percentageofnumerical/designproblems:--
Internalmax.marks:30	Durationofendsemester exam (ESE):--
Externalmax. marks:20	Electivestatus:core/elective
Totalmarks:50	

Instructions:Developallprograms inC++programming language.

1	Writeaprogramtoentermarkof6differentsubjectsandfindoutthetotalmark (Using cin and cout statement).
2	Writeafunctionusingreferencevariablesasargumentstoswapthevaluesofpair of integers.
3	Writeafunction tofindlargest ofthreenumbers.
4	Writeaprogram tofind thefactorialof a number.
5	Defineaclasstorepresentabankaccountwhichincludesthefollowingmembers as Data members: a) Nameofthe depositor b) AccountNumber c) Withdrawalamount d) BalanceamountintheaccountMemberFunctions: a) Toassigninitialvalues b)Todepositan amount c) Towithdraw anamount aftercheckingthe balance d) To displayname andbalance.
6	Writeaprogram forsinglinheritance.
7	Writeaprogramforuse ofconstructor and destructors.
8	Write aprogram forMultipleinheritance.
9	WriteaprogramforMultilevel inheritance
10	Writeaprogramforfilehandling.

ReferenceBooks:

1. ObjectOrientedProgrammingwithC++,E.Balagurusami,FourthEdition,TataMc-GrawHill.
2. ObjectOrientedProgramminginTurboC++,RobertLafore,FourthEditionGalgotiaPublications.
3. TheC++ProgrammingLanguage,BjarnaStroustrup,ThirdEdition,AddisonWesleyPublishingCompany.
4. ObjectOrientedProgrammingUsingC++,Salaria,R.S,FourthEdition,KhannaBookPublishing

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:BVHN501-18

CourseName:Programmingin Python

Program:B.Voc	L:3P:0
Branch:Hardware&Networking	Credits:3
Semester:5th	Contacthours:44hours
Theory/Practical:Theory	Percentageofnumerical/designproblems:40%
Internalmax.marks:40	Durationofendsemesterexam(ESE):3hrs
Externalmax.marks:60	Electivestatus: Core
Totalmarks:100	

Prerequisite:-NA-

Corequisite:-NA-

AdditionalmaterialrequiredinESE:-NA-

Course Outcomes: Students will be able to:

CO#	CourseOutcomes
CO1	FamiliarwithPythonenvironment,datatypes,operatorsusedinPython.
CO2	CompareandcontrastPythonwithotherprogramminglanguages.
CO3	Learntheuseofcontrolstructuresandnumerousnativdatatypeswiththeirmethods.
CO4	Designuserdefinedfunctions,modules,andpackagesandexceptionhandlingmethods.
CO5	CreateandhandlefilesinPythonandlearnObjectOrientedProgrammingConcepts

DetailedContents	Contact hours
Unit-I Introduction to Python Programming Language: Programming Language, History and Origin of Python Language, Features of Python, Limitations, Major Applications of Python,FirstPythonProgram,PythonInteractiveHelpFeature,Pythondifferencesfrom other languages. PythonDataTypes&Input/Output:Keywords,Identifiers,PythonStatement,Indentation, Documentation, Variables, Multiple Assignment, Understanding Data Type, Data Type Conversion, Python Input and Output Functions, Import command. OperatorsandExpressions:OperatorsinPython,Expressions,Precedence,Associativityof Operators, Non Associative Operators.	12
Unit-II Control Structures: Decision making statements, Python loops, Python control statements. PythonNativeDataTypes:Numbers,Lists,Tuples,Sets,Dictionary,Functions&Methodsof Dictionary, Strings (in detail with their methods and operations).	10
Unit-III PythonFunctions:Functions,AdvantagesofFunctions,Built-inFunctions,Userdefinedfunctions, Anonymous functions, Pass by value Vs. Pass by Reference, Recursion, Scope and Lifetime of Variables. PythonModules:Moduledefinition,Needofmodules,Creatingamodule,Importingmodule,Path Searching of a Module, Module Reloading, Standard Modules, Python Packages.	12
Unit-IV ExceptionHandling:Exceptions,Built-inexceptions,Exceptionhandling,Userdefinedexceptions in Python. FileManagementinPython:Operationsonfiles(opening,modes,attributes,encoding,closing), read() & write() methods, tell() & seek() methods, renaming & deleting files in Python. IntroductiontotheconceptofOOPSinPython.	10

TextBooks:

1. ProgramminginPython,PoojaSharma,BPBPublications,2017.
2. CorePythonProgramming,R.NageswaraRao,2ndEdition,Dreamtech.

ReferenceBooks:

1. Python,ThecompleteReference,MartinC.Brown,McGrawHillEducation.
2. PythoninaNutshell,A.Martelli,A.Ravenscroft,S.Holden,OREILLY.

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:BVHN502-18

CourseName:E-Commerce

Program: B.Voc	L: 3 P: 0
Branch: Hardware&Networking	Credits: 3
Semester: 5 th	Contacthours: 40
Theory/Practical: Theory	Percentageofnumerical/designproblems:--
Internalmax.marks: 40	Durationofendsemesterexam(ESE):--
Externalmax.marks: 60	Electivestatus:core/elective
Totalmarks: 100	

Prerequisite:--

Corequisite:--

AdditionalmaterialrequiredinESE:--

CourseOutcomes:

CO#	Course outcomes
CO1	To understand of various applications and scope of e-commerce.
CO2	To know the working of various payment modes used in e-commerce 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
Unit-I 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. Applications in E-commerce: E-commerce Applications in Manufacturing, Wholesale, Retail and Service Sector	10
Unit-II 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.	10
Unit-III Digital Marketing: Understanding Digital Marketing Process, Digital marketing vs. Traditional marketing, Website Planning Process: Understanding Domain names & 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 & Online Display advertising	10
Unit-IV Email marketing Need, working and challenges faced in sending bulk emails, Types of email marketing- Opt-in & bulk emailing, Content marketing Affiliate marketing: Sources to Make Money Online, Blogging & freelancing to make money, Ad Sense, approval process and Ad Sense Administration. E Business Entrepreneurship.	10

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

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:BVHN503-18

CourseName:MicroprocessorandMicrocontroller.

Program: B.Voc	L:3 P:0
Branch: Hardware&Networking	Credits: 3
Semester: 5 th	Contacthours: 40
Theory/Practical: Theory	Percentageofnumerical/designproblems:--
Internalmax.marks: 40	Durationofendsemesterexam(ESE):--
Externalmax.marks: 60	Electivestatus:core/elective
Totalmarks: 100	

Prerequisite:--

Corequisite:--

AdditionalmaterialrequiredinESE:--

Course Outcomes:

CO#	Courseoutcomes
CO1	Studentswillbeabletounderstandpindiagramandarchitectureofvarious microprocessors.
CO2	Studentswillbeabletounderstandthearchitectureofvariouscontrollersinacomputersystem.
CO3	Studentswillbeabletounderstandassemblylevelprograms.

DetailedContents	Contact hours
Unit-I IntroductiontoMicroprocessors ,HistoricalBackgroundofMicroprocessors,Applicationsof Microprocessors, Introduction to 8085, Architecture of 8085, Pin Diagram of 8085.	10
UNIT-II InstructionCycle,TimingDiagramsofMemoryRead/WriteOperations,I/Oreadandwriteoperations ,AddressingModes,IntroductiontoRISC&CISCProcessors.	10
Unit-III Introduction to Microcontroller, Architecture of Microcontroller, Features of Microcontroller, Advantages of Microcontroller, comparison between Microcontroller and Microprocessor. Applications of Microcontroller.	10
Unit-IV Introductionto8257DMAcontroller,Featuresof8257DMAcontroller,Internalarchitectureof8257, interfacing of 8257 with 8085, Pin diagram of 8257 DMA controller.	10

Text/ReferenceBooks:

1. MicroprocessorArchitecture,ProgrammingandApplicationswith8085,Ramesh.S. Gaonkar, Fourth Edition, Penram International Publishing
2. 8051MicrocontrollerandEmbeddedSystems,MuhammadAliMazidiJaniceGillispi Mazidi, Second Edition, PHI
3. FundamentalsofMicroprocessorsandMicrocomputers,B.Ram,FourthEdition,Dhanpat Rai Publications
4. TheIntelMicroprocessors8086/8088,80186/80188,80286,80386,80486,PentiumPro Architecture, Programming and Interfacing, B. Brey, Fifth Edition, Prentice Hall International

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:BVHN504-18

Course Name: CyberSecurity

Program: B. Voc	L:3 P: 0
Branch: Hardware&Networking	Credits:3
Semester: 5 th	Contacthours:40
Theory/Practical: Theory	Percentageofnumerical/designproblems:--
Internalmax.marks: 40	Durationofendsemesterexam(ESE):--
Externalmax.marks: 60	Electivestatus:core/elective
Totalmarks: 100	

Prerequisite:--

Corequisite:--

AdditionalmaterialrequiredinESE:--

Course Outcomes:

CO#	Courseoutcomes
CO1	Toteachthestudentsanalysisandpracticalityofvariousystemsonwhichsoftwaresystemcan be
CO2	AftercompletingthiscourseStudentswillbeabletodesignanddevelopsystems.
CO3	Studentswillbeabletolearnaboutthesystemdevelopmentlifecycle model.
CO4	Studentswillbeabletolearnabouthowtodesignthesystemandhowtofindandremoveerrors with
CO5	Studentwillbeabletounderstandhowsystems shouldbeimplementedand maintained.

DetailedContents	Contact hours
UnitI IntroductiontoCyberSecurity 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	10
UNIT-II CyberSecurityVulnerabilitiesandCyberSecuritySafeguards CyberSecurityVulnerabilities-Overview,vulnerabilitiesinsoftware,Systemadministration,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,DenialofServiceFilters,EthicalHacking,Firewalls,IntrusionDetection Systems, Response, Scanning, Security policy, Threat Management.	10
Unit-III IntrusionDetectionandPrevention Intrusion,PhysicalTheft,AbuseofPrivileges,UnauthorizedAccessbyOutsider,Malwareinfection, 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.	10
Unit-IV Cyberspace and the Law: Introduction, Cyber Security Regulations, Roles of International Law, the stateandPrivateSectorinCyberspace,CyberSecurityStandards.TheINDIANCyberspace,National Cyber Security Policy 2013. CyberForensics:IntroductiontoCyberForensics,ScrutinizingE-mail,ValidatingE-mailheader information, Tracing Internet access, Tracing memory in real-time.	10

TextBooks

1. SystemAnalysisandDesignAwadEliasN.*SecondEdition*,GalgotiaPublications
2. AnalysisandDesignofInformationSystem SenJamesA.*SecondEdition*, TataMcGrawHill.

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:BVHN505-18

CourseName:Programming inPythonLaboratory

Program: B.Voc	L:0P: 3
Branch: Hardware&Networking	Credits: 1.5
Semester: 5th	Contacthours: 4hoursperweek
Theory/Practical: Practical	Percentageofnumerical/designproblems: 90%
Internalmax.marks: 30	Durationofendsemesterexam(ESE): 3hrs
Externalmax.marks: 20	Electivestatus: Core
Totalmarks: 50	

Prerequisite:-NA-

Corequisite:-NA-

AdditionalmaterialrequiredinESE:-Maintainpracticalnotebookaspertheinstructionsbythe instructor.

CourseOutcomes:Studentswillbeableto:

CO#	CourseOutcomes
CO1	SolvesimpletoadvancedproblemsusingPythonlanguage.
CO2	Developlogicofvariousprogrammingproblemsusingnumerousdatatypesandcontrolstructuresof Python.
CO3	Implementdifferentdatastructures.
CO4	Implementmodulesandfunctions.
CO5	DesignandimplementtheconceptofOOP structures.
CO6	Implementfilehandling.

ListofPracticals:

1.	Computesum,subtraction,multiplication,divisionandexponentofgivenvariablesinputbytheuser.
2.	Computeareaoffollowingshapes:circle,rectangle,triangle,square,trapezoidandparallelogram.
3.	Computevolumeoffollowing3Dshapes:cube,cylinder,coneandsphere.
4.	Computeandprintrootsofquadraticequation $ax^2+bx+c=0$,wherethevaluesofa,b,andcareinput by theuser.
5.	PrintnumbersuptoNwhicharenotdivisibleby3,6,9,,e.g.,1,2,4,5,7,....
6.	Printmultiplicationtableofanumberinputbythe user
7.	Computesumofnaturalnumbersfromonetonnumber
8.	PrintFibonacciseriesuptonnumberse.g.011235813.....n
9.	Compute factorialofagivennumber.
10.	Performfollowingoperationsontwomatrices.1)Addition2)Subtraction3)Multiplication
11.	Performfollowingoperationsonalistofnumbers:1)Insertanelement2)deleteanelement3)sortthe list 4)deleteentirelist
12.	DisplaywordafterSortinginalphabeticalorder
13.	Performsequentialsearchonalistofgivennumbers.
14.	WriteaPythonfunctionthatacceptsastringandcalculatesnumberofuppercaselettersandlowercase lettersavailableinthatstring.
15.	To findtheMaxofthreenumbersusingfunctions
16.	DesignaPythonclassnamedRectangle,constructedbylength&width,alsodesignamethodwhichwill computetheareaofarectangle.
17.	DesignaPythonclasstoreverseastring‘wordbyword’.
18.	WriteaPythonprogramtoreadanentiretextfile.
19.	DesignaPythonprogramtoreadfirstnlinesofatextfile
20.	ConstructaPythonprogramtowriteandappendtexttoafileanddisplaythetext.

TextBooks:

1. ProgramminginPython,PoojaSharma,BPBPublications,2017.
2. CorePythonProgramming,R.NageswaraRao,2ndEdiiton,Dreamtech.

ReferenceBooks:

1. Python,ThecompleteReference,MartinC.Brown,McGrawHillEducation.
2. PythoninaNutshell,A.Martelli,A.Ravenscroft,S.Holden,OREILLY.

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:BVHN506-18

CourseName:HARDWARELAB-II(Microprocessors)

Program: B.Voc	L:0P:3
Branch: Hardware&Networking	Credits: 1.5
Semester: 5th	Contacthours: 4hoursperweek
Theory/Practical: Practical	Percentageofnumerical/designproblems: 90%
Internalmax.marks: 30	Durationofendsemesterexam(ESE): 3hrs
Externalmax.marks: 20	Electivestatus: Core
Totalmarks: 50	

Prerequisite:-NA-

Corequisite:-NA-

AdditionalmaterialrequiredinESE:-Maintainpracticalnotebookaspertheinstructionsgivenby the instructor.

CourseOutcomes:Studentswillbeableto:

CO#	CourseOutcomes
CO1	Solvesimpletocomplexproblemsusingassemblylanguage.
CO2	Solve1'sand2'scomplementofvarious numbers
CO3	Solveaddition,subtractionandcomplementof8bitand16bitnumbers.

ListofPracticals:

1.	Toexamineandmodifythecontentsofaregisterandmemorylocation.
2.	Toaddtwo8-bit hexadecimal numbers without considering the carry generated.
4.	Tosubtracttwo8-bit hexadecimal numbers without considering borrow.
5.	Tosubtracttwo8-bit hexadecimal numbers considering borrow.
6.	Toaddtwo16-bit hexadecimal numbers without considering the carry generated.
7.	Toaddtwo16-bit hexadecimal numbers considering the carry generated.
8.	Tosubtracttwo16-bit numbers without considering borrow.
9.	Tosubtracttwo16-bit numbers considering borrow.
10.	Tofind2's complement of 8-bit hexadecimal number.

Text/ReferenceBooks:

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

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:**BVHN601-18**
CourseName:**WebDesigning**

Program: B.Voc	L: 3 P: 0
Branch: Hardware&Networking	Credits: 3
Semester: 6 th	Contacthours: 40hours
Theory/Practical: Theory	Percentageofnumerical/designproblems:--
Internalmax.marks: 40	Durationofendsemesterexam(ESE):--
Externalmax.marks: 60	Electivestatus: core/elective
Totalmarks: 100	

Detailedcontents	Contact hours
Unit1 Internet Basics: Basic concepts, communicating on the internet, internet domains,internet server identities. Introduction To HTML: 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). BasicFormattingTags HTML Basic Tags, Text Formatting (Paragraph Breaks, Line Breaks), Emphasizing Material in a Web Page (Heading Styles, Drawing Lines), Text Styles (Bold, Italics, Underline),OtherTextEffects(Centering(Text,Imagesetc.),Spacing(IndentingText), HTMLColorCoding.	10
Unit2: Lists : Type of Lists (Unordered List (Bullets), Ordered Lists (Numbering), Definition Lists. Adding Graphics To Html Documents : Using The Border Attribute, Using The Width And Height Attribute, Using The Align Attribute, Using The Alt Attribute. Tables : 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 Linking Documents: Links (External Document References, Internal Document References), Image As Hyperlinks. Frames : Introduction to Frames: The<FRAMESET> tag, The <FRAME> tag, Targeting Named Frames. DHTML: Cascading Style Sheets, Style Tag.	10
Unit3: Forms Used by a Web Site: The Form Object, The Form Object's Methods (The Text Element,ThePasswordElement,TheButtonElement,TheSubmit(Button)Element,The Reset (Button) Element,TheCheckboxElement,TheRadioElement,TheTextAreaElement,TheSelect and Option Element, The Multi Choice Select Lists Element).	10
Unit4: Introduction to JavaScript : JS Introduction, Where To, Output, Statements, Syntax, Comments, Variables, Operators, Arithmetic, Assignment, Data Types, Functions, Numbers,NumberMethods,Arrays,ArrayMethods,ArraySort,ArrayIteration,Dates, Date Formats, Date Get Methods, Date Set Methods, Math, Random, Booleans, Comparisons, Conditions, Switch, Loop For, Loop While, Break.	10

TextBooks:TextBooks/ReferenceBooks:

1. InternetforEveryOne:AlexisLeon,1stEdition,LeonTechworld,Publication,2009.
2. GreenlawR;Heppe,“FundamentalsofInternetandWWW”,2ndEdition,TataMcGraw-Hill,2007.
3. RajKamal,“Internet&WebTechnologies”,editionTataMcGraw-HillEducation.2009.

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:BVHN602-18
Course Name:EnvironmentScience

Program: B.Voc	L: 3 P: 0
Branch: Hardware&Networking	Credits: 3
Semester: 6 th	Contacthours: 40
Theory/Practical: Theory	Electivestatus: core/elective
Internalmax.marks: 40	
Externalmax.marks: 60	
Totalmarks: 100	

Detailedcontents	Contact hours
Unit 1: Introduction to Environmental Studies Multidisciplinary nature of Environmental Studies: Scope & Importance, Need for Public Awareness.	10
Unit 2: Ecosystems, Concept of an Ecosystem: Structure & functions of an ecosystem (Producers,Consumers&Decomposers) EnergyFlowinanecosystem: FoodChain,Food web and Ecological Pyramids Characteristicfeatures,structure&functionsoffollowingEcosystems: • ForestEcosystem • AquaticEcosystem(Ponds,Lakes,River&Ocean)	10
Unit3:NaturalResourcesRenewable&Non-renewableresources Forest Resources: Their uses, functions & values (Biodiversity conservation, role in climate change, medicines) & threats (Overexploitation, Deforestation) Water Resources: Their uses (Agriculture, Domestic & Industrial), functions & values, Overexploitation and Pollution of Ground & Surface water resources (Case study of Punjab), Water Conservation, Rainwater Harvesting Land Resources: Land as a resource; Land degradation, soil erosion and desertification. EnergyResources: Renewable&non-renewableenergyresources,useofalternative energy resources.	10
Unit4:BiodiversityconservationandEnvironmentalPollution TypesofBiodiversity: Species,Genetic&Ecosystem,Indiaasamegabiodiversity nation, Biodiversity hot spots and biogeographic regions of India EnvironmentalPollution: Types, Causes, Effects &Control of Air, Water, Soil&Noise Pollution ,Nuclear hazards and accidents & Health risks GlobalClimateChange: Globalwarming,Ozonedepletion,Acidrain,Meltingof Glaciers & Ice caps, Rising sea levels Environmentaldisasters: Earthquakes,Floods,Cyclones,Landslides	10

TextBooks:

1. Bharucha,E.TextBookforEnvironmentalStudies.UniversityGrantsCommission,NewDelhi.
2. Agarwal,K.C.2001EnvironmentalBiology,NidiPubl.Ltd.Bikaner.
3. BharuchaErach,TheBiodiversityofIndia,MapinPublishingPvt.Ltd.,Ahmedabad –380013,India, Email:mapin@icenet.net (R)
4. BrunnerR.C.,1989,HazardousWasteIncineration,McGrawHillInc.480p
5. ClarkR.S.,MarinePollution,ClandersonPressOxford(TB)
6. Cunningham,W.P.Cooper,T.H.Gorhani,E&Hepworth,M.T.2001,EnvironmentalEncyclopedia,Jaico Publ. House, Mumbai, 1196p
7. DeA.K.,EnvironmentalChemistry,WileyEasternLtd.
8. DowntoEarth,CentreforScienceandEnvironment(R)
9. Gleick,H.P.1993.Waterincrisis,PacificInstituteforStudiesinDev.,Environment&Security.Stockholm Env. Institute Oxford Univ. Press. 473p
10. HawkinsR.E.,EncyclopediaofIndianNaturalHistory,BombayNaturalHistorySociety,Bombay(R)
11. Heywood,V.H&Waston,R.T.1995.GlobalBiodiversityAssessment.CambridgeUniv.Press1140p.

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B.Voc.(HardwareandNetworking),Batch-2018

Course Code : BVHN603-18
CourseName:OperatingSystem

Program: B.Voc	L: 3 P: 0
Branch: Hardware&Networking	Credits: 3
Semester: 6 th	Contacthours: 40
Theory/Practical: Theory	Electivestatus: core/elective
Internalmax.marks: 40	
Externalmax.marks: 60	
Totalmarks: 100	

Detailedcontents	Contact hours
Unit1: Fundamentals of Operating system: 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. Process & Thread Management: Program vs. Process; PCB, State transition diagram, Scheduling Queues, Types of schedulers, Concept of Thread, Benefits, Types of threads, synchronization issues. CPU Scheduling: 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
Unit2: Memory Management: Introduction, address binding, relocation, loading, linking, memory sharing and protection; Paging and segmentation; Virtual memory: basic concepts of demand paging, page replacement algorithms.	10
Unit3:I/ODeviceManagement: I/Odevicesandcontrollers,devicedrivers; disk storage FileManagement: Basicconcepts,fileoperations,accessmethods,directorystructures andmanagement,remotefilesystems;fileprotection.	10
Unit4: Advanced Operating systems: Introduction to Distributed Operating system, Characteristics, architecture, Issues, Communication & Synchronization; Introduction Multiprocessor Operating system,Introduction to Real-Time Operating System and its Characteristics.	10

TextBooks:

1. OperatingSystemPrinciplesbyAbrahamSilberschatzandPeterBaerGalvin,SeventhEdition, Published by Wiley-India.
2. PrincipalsofOperatingSystembyNareshChauhan,PublishedbyOXFORDUniversityPress, India.

ReferenceBooks:

1. OperatingSystemsbySibsankarHaldarandAlexA.Aravind,PublishedbyPearsonEducation.
2. OperatingsystembyStalling,W.,SixthEdition,PublishedbyPrenticeHall(India).

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B.Voc.(HardwareandNetworking),Batch-2018

Code:BVHN604-18

CourseName: ComputerPeripheralsandInterfaces

Program:B.Voc	L: 3 P:0
Branch:Hardware&Networking	Credits:3
Semester:6 th	Contacthours:40
Theory/Practical:Theory	Electivestatus:core/elective
Internalmax.marks:40	
Externalmax.marks:60	
Totalmarks:100	

Detailed contents	Contact hours
Unit 1: SYSTEM RESOURCES: Interrupt, DMA Channel, I/O Port Addresses and resolvingandresolvingtheconflictOfresources.I/Obuses-ISA,EISA,Localbus,VESA Local bus, PCI bus, PCI Express, Accelerated graphics port bus.	10
Unit 2: IDE & SCSI Interfaces: IDE origin, IDE Interface ATA standards ATA1 to ATA7.ATAfeature,ATARAIDandSCSIRAIID,SCSICableandpinConnectorpin outs SCSI V/s IDE Advantages and limitation.	10
Unit 3: Video Hardware : Video display technologies, DVI Digital signals for CRT Monitor,LCDPannels,Videoadaptertypes,IntegratedVideo/Motherboardchipset,Video RAM, Video driver and multiple Monitor, Graphic accelerators.	10
Unit4:I/OInterfaces: I/OInterfacesfromUSBandIEEE1394,I/OInterfacefromserial and Parallel to IEEE1394 and USB 961, Parallel to SCSI converter. Testing of serial and parallel port, USB Mouse/ Keyboard Interfaces. Input/OutputDriversoftwareaspects: RoleofdevicedriverDOSandUNIX/LINUX device drivers.	10

Text/ReferenceBooks:

1. DouglasV.Hall,“MicroprocessorsandInterfacing”,TataMcGrawHill2006.
2. BarryB.Brey&C.R.Sarma”Theintelmicroprocessors,”Pearson 2003.
3. P.PalChandhari,“ComputerOrganizationanddesign”PrenticeHallofIndiaPvt.Ltd,1994.
4. DelCorso,H.Kirrmann,JDNicond“Microcomputerbuses&links”AcademicPress1986.

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B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:BVHN605-18

CourseName:WebDesigning Laboratory

Program: B.Voc	L:0P:3
Branch: Hardware&Networking	Credits: 1.5
Semester: 6 th	Contacthours: 24hours
Theory/Practical: Practical	Percentageofnumerical/designproblems:--
Internalmax.marks: 30	Durationofendsemesterexam(ESE):--
Externalmax.marks: 20	Electivestatus: core/elective
Totalmarks: 50	

Instructions:Instructorcanincrease/decreasetheexperimentsaspertherequirement.

1	CreateasimpleHTMLpagetodemonstratetheuseofdifferenttags.
2	Designindexpageofabookonwebdesigning.
3	DisplayLetterHeadofyourcollegeonawebpage.
4	CreateaHyperlinktomovearoundwithinasinglepageratherthantoloadanotherpage.
5	DisplayletterusingdifferentTextformattingTags.
6	DesignTimeTableofyourdepartmentandhighlightsofmostimportant periods.
7	UseTablestoprovidelayouttoyourwebpage.
8	Designawebpageanddisplaytwodifferentpagesata time.
9	WriteanHTMLcodeTocreateaRegistrationForm.Onsubmittingtheform,theuser should be asked to login with the new credentials.
10	Writeaprogramtoperformfollowingoperationsontwonumbersinputbytheuser: Addition 2) subtraction 3) multiplication 4) division

ReferenceBooks:

1. GreenlawR;HeppE,“FundamentalsofInternetandwww”,2ndEdition,Tata.McGraw-Hill, 2007.
2. ABeginner’sGuidetoHTML[Http://www.Ncsa.Nine.Edit/General/Internet/www/html.prmter](http://www.Ncsa.Nine.Edit/General/Internet/www/html.prmter).

OnlineExperimentmaterial

1. https://www.w3schools.com/html/html_examples.asp
2. https://www.cs.uct.ac.za/mit_notes/web_programming.html

IKGujralPunjabTechnicalUniversityJalandhar
B.Voc.(HardwareandNetworking),Batch-2018

CourseCode:**BVHN606-18**

CourseName:**OperatingSystemLaboratory**

Program: B.Voc	L:0P:3
Branch: Hardware&Networking	Credits: 1.5
Semester: 6th	Contacthours: 24hours
Theory/Practical: Practical	Percentageofnumerical/designproblems:--
Internalmax.marks: 30	Durationofendsemesterexam(ESE):--
Externalmax.marks: 20	Electivestatus:core/elective
Totalmarks: 50	

1	InstallationofwindowsOS.
2	InstallationofLinuxOS.
3	DualbootinstallationofOperatingsystems.
4	ImplementationofFCFSSchedulingalgorithm.
5	ImplementationofSJFSchedulingalgorithm.
6	ImplementationofRound-RobinSchedulingalgorithm.
7	ViEditor&itscommands.
8	ShellCommands.
9	ShellScripting-Usingvariables.
10	ShellScripting-Input&Output.

ReferenceBooks:

1. Linux:ThecompleterefERENCEbyRichardPetersen,PublishedbyTataMcGraw-Hill Publication.
2. OperatingSystemPrinciplesbyAbrahamSilberschatzandPeterBaerGalvin,Seventh Edition, Published by Wiley-India.