Dayananda Sagar University
live the dream

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Ref : DSU/Reg/2020-21/169

Date : 09.03.2021

NOTIFICATION

SUB : Scheme & Syllabus of BVoc - I & II Semesters in Computer Engineering & IT Infrastructure Program of Dayananda Sagar University –Reg.,

Ref: Resolution of the Board of Governors passed at its 15th Meeting held on 21.01.2021

Pursuant to resolution passed by the Board of Governors, at it's 15th Meeting held on 21.01.2021 , University is pleased to notify the Scheme & Syllabus of BVoc - I & II Semesters in Computer Engineering & IT Infrastructure Program , which is applicable from the Academic Year 2020-21 , onwards.

By Order

Registrar

9/3/21

CC: PS – Vice Chancellor / Pro Vice Chancellors /COE/CIO/CFO/ Deans/Principals / Chairpersons of Schools/Departments/Dean Research/Director IQAC

Enclosure: Scheme & Syllabus of BVoc - I & II Semesters in Computer Engineering & IT Infrastructure Program

DAYANANDA SAGAR UNIVERSITY

Shavige Malleshwara Hills, Kumaraswamy Layout,

Bengaluru - 560114, Karnataka.

SCHOOL OF ENGINEERING

SCHEME & SYLLABUS
FOR
BACHELOR OF VOCATION

SPECIALIZATION

COMPUTER ENGINEERING & IT INFRASTRUCTURE

(I& II Sem)

09.03.2021

SCHEME AND SYLLABUS FOR

B.VOC IN COMPUTER ENGINEERING AND IT INFRASTRUCTURE.

AY: 2020-2021

1st Semester

GENERAL EDUCATION COMPONENTS :12 CREDITS,180H					
SL.	PROGRAM CODE	COURSE CODE	COURSE NAME	CREDITS	HOURS
1.	P007	20VC101	ENGLISH	2	30
2.		20VC102	MATHEMATICS - I	3	45
3.		20VC103	APPLIED SCIENCE	2	30
4.		20VC104	PROBLEM SOLVING TECHNIQUES	3	45
5		20VC105	BASICS OF ELECTRICAL & ELECTRONICS	2	30
			TOTAL	12	180
SKILL COMPONENTS :18 CREDITS,270H					
6.	P007	20VC106	BASICS OF ELECTRICAL & ELECTRONICS LAB	6	90
7.		20VC107	BASICS OF COMPUTER LAB	6	90
8.		20VC108	PC HARDWARE LAB	6	90
			TOTAL	18	270

SCHEME AND SYLLABUS FOR

B.VOC IN COMPUTER ENGINEERING AND IT INFRASTRUCTURE.

AY: 2020-2021

2nd Semester

GENERAL EDUCATION COMPONENTS :12 CREDITS,180H					
SL.	PROGRAM CODE	COURSE CODE	COURSE NAME	CREDITS	HOURS
1.	P007	20VC201	COMPUTER NETWORKS - I	2	30
2.		20VC202	PYTHON	3	45
3.		20VC203	MATHEMATICS – II	2	30
4.		20VC204	C- PROGRAMMING	2	30
5		20VC205	DATA BASE	3	45
			TOTAL	12	180
SKILL COMPONENTS :18 CREDITS,270H					
6.	P007	20VC206	SQL SERVER 2008 LAB	6	90
7.		20VC207	C – PROGRAMMING & PYTHON LAB	6	90
8.		20VC208	NETWORKING LAB	6	90
			TOTAL	18	270

SEM/YEAR	**: I SEM/1st Year**
COURSE CODE	**: 20VC101**
TITLE OF THE COURSE	**: English**
L: T/A: P: C	**: 2: 0: 0: 2**

Course objectives

- To Speak fluently
- To Make simple technical presentations
- To Develop Communication skills for academic and social interaction.
- To comprehend technical literature by listening.
- To write technical documents in correct English.
- To have a better interactive skill.

Course outcomes

- Students achieve proficiency in English
- Develop their professional communication skills
- Acquire skills for placement

UNIT 1: Parts of Speech **(8 hours)**

Noun- Different kind of nouns, Numbers, Articles, Pronoun- Different kind of pronouns, Adjectives- Degrees of comparison, Verbs- Verb forms (V1,V2,V3), Active and Passive voice, Adverbs, Preposition, Conjunctions, Interjection.

UNIT 2: VERBTENSES **(5 hours)**

Main divisions, Subdivisions

UNIT 3: LANGUAGE SKILLS DEVELOPMENTEXERCISES **(6 hours)**

Reading and Listening Exercises- Comprehension Passages, Stories, Newspaper Reading, Spoken English exercises- Self-Introduction, Story Telling, Announcements, Talk on given situations/topics

UNIT 4: WRITING SKILL and SENTENCES **(5 hours)**

Letter writing (Leave Letter/Apology Letter), Types of Sentences, Question Tags, Direct and Indirect Speech

UNIT 5: LANGUAGESKILLSDEVELOPMENT **(6 hours)**

Arranging a set of information in proper order, Story development from bare outlines, Role plays Practice on giving directions, Question & Answer sessions

Text Books:

1. High School English Grammar by Wren &Martin - S. Chand &Co. Ltd
2. English Communication for Polytechnics by S. Chandra shekhar & Others – Orient Black Swan
3. English Grammar at Glance by M. Gnanamurali - S. Chand & Co. Ltd
4. Effective English by E. Suresh Kumar & Others – Pearson

SEM/YEAR	**: I SEM/1st Year**
COURSE CODE	**: 20VC102**
TITLE OF THE COURSE	**: Mathematics - I**
L: T/A: P: C	**: 3: 0: 0: 3**

Course objectives

To introduce the students to mathematical tools used in various engineering branches.

Course outcomes

- An ability to apply knowledge of mathematics, science and engineering.
- An ability to identify, formulate and solve engineering problems.
- An ability to use the techniques , skills and engineering tools

Unit 1 **(10 hrs)**

Linear Equations

Solutions to linear equations, Solutions to quadratic equations by factorization, Solutions to quadratic equations using formula).Linear Algebra: Linear spaces, Subspaces, Linear independence, Bases and Dimensions, Orthogonality, Gram Schmidt Orthogonalization process

Unit 2 **(8hrs)**

Matrices & Determinants

Matrix Definition, Addition, Subtraction, Multiplication and Transpose of Matrix, Definition of determinant, Properties and its Evaluation, Minors, Co-factors, Determinant of transpose, Linear equation Solution (Cramer's rule)

Unit 3 **(9 hrs)**

Complex Numbers - Introduction, representation of complex numbers, Representation on graph, Addition, Subtraction and multiplication, Complex conjugate, graph representation, Division of complex numbers, Polar form of complex number, Polar form of complex number, Conversion from polar to rectangular and vice-versa. **Vectors**-Introduction, Unit vector, Multiply vector by a scalar, Adding vectors algebraically and graphically, Magnitude and direction, Vector dot product and length, Vector cross product, Direction(right and rule),Area of parallelogram, Work done on moving object by a force (dot Product),Torque exerted by force (Cross Product)

Unit 4 **(10hrs)**

Differential Calculus: Definition and evaluation of limits, Definition of Derivative, Slope of tangent at a point on the curve, Differentiation of constant, e^x,x^n,a^x and log x, Differentiation of trigonometric functions, Differentiation of Sum, difference, product and quotient of functions, Application of differentiation-velocity and acceleration.

Statistics: Mean, Median and mode, Moving average, Grouping of data, Class interval, Range, Standard Deviation & Variance, Histogram, Skewness, Interpretation of skewness, Normal distribution.

Unit 5 **(8hrs)**

Sequence and series: Sequence, Series, Recursive and explicit formulas.

Set Theory: Definition of Sets, Venn Diagrams, Subset, Power Set, Cardinality and Cartesian products, Set Operations: AND,OR, NOT, Conditional statements, Univariate, Bi-variate and Multi variate data.

Permutation & Combination: Multiplication and addition principle of counting, Permutation, Combination, Exercise on permutation and combination

Text Books:

1. Erwin Kreyzig, Advanced Engineering Mathematics, Wiley, Tenth edition
2. Thomas and Finney, Calculus and Analytic Geometry, Pearson India, Ninth edition

Reference Books:

1. G.F. Simmons and S. Krantz, Differential Equations Theory, Techniques and Practice, Tata McGraw Hill.
2. W.E. Boyce and R.C. DiPrima, Elementary Differential Equations and Boundary Value Problems, Ninth Edition, Wiley Student Edition.

SEM/YEAR	**: I SEM/1st Year**
COURSE CODE	**: 20VC103**
TITLE OF THE COURSE	**: Applied Science**
L: T/A: P: C	**: 2: 0: 0: 2**

Course objectives

- To create awareness of correct usages of SI units.
- To understand the relationship between laws and specific phenomena.
- To understand the method of composition and resolution of forces Study the condition of equilibrium of a system of forces Recognize moment as one, which gives rotation effect.
- To identify the acidic, basic or neutral nature of solution
- To understand about solar energy and its applications
- To understand the general properties and uses of certain organic compound
- To create awareness of phenomenon Modern Physics & on wave motion
- To get exposure on laser

Course outcomes

- Students can understand the importance of force and energy
- Moments and its applications are learnt
- Students are able to understand properties of solid and fluids
- Students are able to identify the acid and basic nature of solution
- Students got exposure on laser

UNIT 1 **(08 hours)**

PHYSICAL WORLD, FORCE & MOTION ENERGY

Physical Quantities Types of systems of units, Fundamentals of derived quantities, SI units Dimension Linear motion Displacement, velocity, acceleration. Equations of motion Problems Newton's laws of motion. Momentum (Linear) Law of conservation of momentum Force Inertia. Work power, Energy Law of conservation of energy.

UNIT 2 **(06 hours)**

Composition and resolution of forces: Definition, law of parallelogram of forces, triangle law of forces, polygon law of forces.

EQUILIBRIUM OF FORCES: Introduction. System of forces Principle of equilibrium Lami's Theorem Problems Moments and its applications. Couple.

UNIT 3 **(05 hours)**

PROPERTIES OF SOLIDS AND FLUIDS

Physical properties, chelical properties, mmechanical properties, eelectrical properties, Optical

properties.**Lubrication and lubricants:** Basics of lubrication, Types of lubricants, Selection of lubricant

UNIT 4 **(05 hours)**

HEAT

Definition of heat Thermometry. Platinum resistance thermometer, Thermo couple. Pyrometer. Calorimetry Specific heat capacity Heat Transfer. **Optical fiber:** Optical fiber, types, working principle, application

UNIT 5 **(06 hours)**

Laser

Introduction and properties of laser, types and application

Renewable energy

PV panels, specifications, Mppt, Wind turbine types, working of wind turbine, Types of batteries, PV system requirement calculations,

Text Books:

1. Principle of physics for class XI and XII by V. K.Mehata and Rohit Mehta, as per Karnataka state PUC syllabus S. Chand and Company, New Delhi
2. Engineering chemistry for Diploma by Ranjan Kumar Mahapatra (PHI Learning Pvt. Ltd., New Delhi)
3. Basic Physics by Kongbam Chandramani Singh (PHI Learning Pvt. Ltd., New Delhi)
4. Principle of physics by P.V. Naik (PHI Learning Pvt. Ltd. New Delhi)

SEM/YEAR	**: I SEM/1st Year**
COURSE CODE	**: 20VC104**
TITLE OF THE COURSE	**: Problem Solving Techniques**
L: T/A: P: C	**: 3: 0: 0: 3**

Course objectives

- To understand the basic computers and component of computer
- To understand about various classes of computers, speed and memory
- To gain knowledge about input and output devices
- To learn about data storage devices.

Course outcomes

- Students are able to learn about components of computer
- Students are able to identify the various data storage devices and its applications
- Acquire the skills about Operating systems and GUI

UNIT 1 **(8 hours)**

Introduction to Algorithm

What is an algorithm? Characteristics of an Algorithm

UNIT 2 **(10 hours)**

Method for Developing an Algorithm

Sequence structure, Selection structure, repetition structure, Flowcharts, Flowchart Constructs,

Flowchart Example

UNIT 3 **(9 hours)**

Pseudo code (or Program Design Language)

PseudocodeLanguageConstructs5, Computation/Assignment, Input/Output, Selection, Repetition, Pseudo code Example

UNIT 4 **(9 hours)**

Programming using C

How to develop a program using C language, Simple program examples

UNIT 5 **(9 hours)**

Problem solving

Introducing Computational Thinking, What is CT? Exploring Algorithms, Computational Thinking is a problem-solving process that includes the following characteristics. Finding Patterns, Developing

Algorithms, Decomposition, Abstraction, Pattern Recognition, Designing algorithms, Computer Hardware's Computer Software, Final Project: Applying Computational Thinking,

Text Books:

i) Computer Fundamentals – by P.K. Sinha, BPB Publications

Reference Books:

i) Computer Programming – by P. Kumar Wiley publication

ii) "Computer Fundamentals and Programming in C ", - by Reema Thareja, Oxford Press, 2014

SEM/YEAR	**: I SEM/1st Year**
COURSE CODE	**: 20VC105**
TITLE OF THE COURSE	**: Basics of Electrical & Electronics**
L: T/A: P: C	**: 2: 0: 0: 2**

Course objectives

- To effectively used digital multi-meter, function generator and oscilloscope.
- To analyse the working of a diode and its characteristics
- To understand the characteristics of different electronic devices.
- To understand the types of rectifiers and their working

Course outcomes

- Students are able to understand the
- Students are able to identify the types of rectifier.

UNIT 1 **(6 hours)**

Atomic Structure and Introduction to electron current

Atom-Electron orbit& Energy levels, Concept of electric friction(resistance),current and voltage with definition(s) Unit, Ohms Law, a)Temperature effect on resistance,(b) Ideal Vg source and current source, Power, Energy, and energy in Kilo watthour i.e., Unit with examples,

Resistors and Kirchhoff's law

Resistance in series, Resistance in Parallel and related problems, Open circuit and short circuits,

Kirchhoff's voltage law with problems, Kirchhoff's current law with problems,

UNIT 2 **(6 hours)**

Capacitors & Fundamentals of AC: Capacitance of a Capacitor, Principle of Capacitance, Di-electric strength, effect of dielectric material on capacitance of a capacitor and types, Capacitorsin series and Parallel Combination, Different Waveforms, cycle, frequency, Time period, Instantaneous value, rms value, peak value, peak to peak value, amplitude

Basic Semiconductor and P.N. junction Theory: Energy bands in conductors, semiconductors and insulators, Conduction in conductors and semiconductors, P-Type &N-type Semiconductor, PN junction– Unbiased and biased PN junction Forward Biasing and Reverse Biasing

UNIT 3 **(6 hours)**

Semiconductor Diodes, Zener Diodes and LED: Introduction to P.N.-junction diodes, Diode characteristics & Description of diode equation, Zener diodes characteristics & parameters, Light

emitting diodes, its working principle characteristics& Application, Half wave rectifier, Full wave rectifier, Full wave bridge rectifier,

UNIT 4 **(7 hours)**

Digital Basics
Introduction to digital system, Difference between digital and analog signals, Number system–different types, Conversion of Decimal to Binary and vice versa, Conversion of Decimal to hexadecimal and vice versa, Conversion of binary to hexa decimal and vice versa, Binary coded decimal, ASCII,EBCDIC, Complement arithmetic [1's,2's], Binary addition

UNIT 5 **(05 hours)**

Logic Gates
Introduction of logic gates, Inverter- OR-AND-NOR– NAND symbol and truth table, XOR -XNOR gates, Construction of logic circuits using gates

Text Books:

1. Electronic Circuits: Fundamentals and Applications by Michael Tooley BA Elsevier Ltd., Third Edition,2006
2. Electronic Devices and Circuits, Allan Motter shed, PHI.

Reference Books:

1. Robert. L. Boylestad and L. Nashelsky, Electronic Devices and circuit Theory, Pearson Education,9th edition, 2005
2. David A Bell, Electronic Devices and Circuits, PHI,5th edition ,2007
3. Millman & Halkias, Electronics Devices and Circuits, McGraw Hill.

SEM/YEAR	**: I SEM/1st Year**
COURSE CODE	**: 20VC106**
TITLE OF THE COURSE	**: Basics of Electrical & Electronics LAB**
L: T/A: P: C	**: 0: 0: 12:6**

Course objectives

- To understand Circuit operation of different types of voltage regulation circuits, including series.
- To explain the construction and characteristics of diodes, bipolar junction transistors and optical devices.

Course outcomes

- Ability to understand and analyse, linear and digital electronic circuits.

List of experiments:

1. Familiarization of toolkit
2. Soldering Practice
3. Familiarization of CRO
4. Familiarization of function Generator
5. Familiarization of Digital Multi meters
6. Color coding of the resistor
7. Verification of Ohm 'slaw
8. Verification of KVL and KCL
9. Study of diode datasheet and V.I Characteristics of diodes
10. Study of Zener datasheet and V.I Characteristics of Zener diodes
11. Rectifiers-Half-wave and centre -tapped full-wave rectifier
12. Bridge rectifier with capacitor filter
13. Familiarization of Logic Inverter(TTL)
14. Familiarization of AND Gate(TTL)
15. Familiarization of OR Gate(TTL)
16. Familiarization of NAND Gates(TTL)
17. Familiarization of NOR Gates(TTL)
18. Familiarization of EXOR Gates(TTL)
19. Universal Property of NAND and NOR Gates

SEM/YEAR	**: I SEM/1st Year**
COURSE CODE	**: 20VC107**
TITLE OF THE COURSE	**: Basics of Computer LAB**
L: T/A: P: C	**: 0: 0: 12:6**

Course objectives

- To learn about DOS commands
- To increase typing speed and confidence
- To create bio-data with suitable alignments
- To create the presentation& to create the email

Course outcomes

- Student can able to learn about DOS Commands
- Students are able to increase the typing speed and confidence
- Students are able to create the bio-data, power point presentation and email on their own.

List of experiments:

Exercise 1: Components of Computer

1. Input devices and output devices
2. Functional units of computer Functional units of computer

Exercise 2: DOS Commands

1. Write the syntax and definition of following commands: cls, cd, copy, copy con, Mem, Tree, ver, exit, find, sort, time, edit, erase, date, del, dir, md, rd, type.
2. Write the syntax for appending the content of two files, copy the output of dir command to file, listing of files and directories: dir/b, dir/l, dir/on, dir/w, definition of following commands: dir/ad, dir/oe, dir/p, dir/ar.

Exercise 3: Typing Tutorial

1. Familiarize typing in standard QWERTY keyboards.
2. Touch Typing Course: In this course, Trainee will learn the positions of the letter keys and common punctuation by heart, after completing the course you will be able to type with all ten finger without looking at the keyboard.
3. Speed Building course: This course is designed to increase your typing speed and confidences. The Trainee will focus on the keys for each finger, type longer texts and train with some of the most common English words
4. Numbers, Special marks and 10-key pad.4.1: Numbers Course: This two lesson course teaches how to type numbers on the number row 4.2: Special Marks Course: Extend Trainees skills to cover special marks, including Internet characters.
5. Mathematical symbols and brackets: 10-key Number pad Course: Learn to use the 10-key number

pad with touch typing technique.

Exercise 4: Creating Document

1. Create the document in word pad with following information Name, qualification, city, date of birth, phone number, and increase the size of font to 24, make it bold ,put the heading as information and align it centre.
2. Create your bio data in note pad with suitable formats.
3. Demonstrate procedure for creating, naming, renaming of a folder in computer and familiarize properties like changing the icon, hiding a folder and changing attributes.

Exercise 5: Applications

1. How to open DOS, NOTEPAD, PAINT, CALCULATOR, and WORDPAD THROUGH RUN.?
2. How to create shortcuts, disappearing the desktop items, auto hide the task bar?
3. What is Status bar, Menu bar, Taskbar, Standard Toolbar, and specify their locations.
4. What is the extension of the following application: WordPad, Notepad, and Paint?

Exercise 6: MS-Office

1. Create your CV (Bio Data) in MS-word with suitable alignments.
2. Create the paint file insert the picture in it by choosing from different place and modify it in WordPad.
3. What is Border and Shading? Write the steps for applying Border & Shading to a Paragraph in WordPad.
4. What is Bullets and Numbering? Write the steps for applying Bullets and Numbering, and its different types in WordPad
5. What is spelling and grammar check. Write the steps for this and different option present in it in WordPad.
6. What is the use of Find and Replace and Go to option? Write the steps for that with example in WordPad.
7. Write the steps for inserting Symbols and special characters and inserting Date and Time, File, Object with example in WordPad.
8. Demonstrate the steps to create and enter records mail merge
9. Type the invitation for calling your friends on the occasion of your birthday using mail merge, WordArt, select the field names yourself.
10. Write the steps for creating a table. Explain merge cells and split cells options.
11. Open Ms-Excel and insert 10 sheets, apply different backgrounds to different sheets, fill different colours in different cells.

12. Open Ms-Excel insert 4 sheets hide the sheet 2 and 3 and apply different colour to sheet tabs.
13. Demonstrate mathematical function in MS-Excel.
14. How to insert Rows, Columns, Cells and Worksheet in MS-Excel?
15. Create the presentation about you daily activity
16. Create the presentation of your organization company with suitable diagrams.
17. Create the presentation to explain any technology with suitable diagrams.
18. Create the presentation for any educational organization which should consist of hyperlinks, custom animation, slide transition
19. Create the DATABASES for the Company consisting of the tables: EMPLOYEE, DEPARTMENT, DESIGNATION, ACCOUNTS. And the fields are as follows EMP: Name, City, Add, Phno, Place, and Id. DEPARTMENT: Id, Dep Name, and Location. DESIGNATION: Id, Qualification, Experience, Skills. ACCOUNTS: Id, Basics, DA, HRA, PF. (MAKE ID AS PRIMARYKEY) and create the query to select the fields as: EMP=ID, NAME, PHNO, PALCE. DEP=DEPNAME, LOCATION. DESIG=QUALIFOCATION, EXP.ACCOU=TOTAL, BASICS, DA, PF.

Exercise 7: Internet

1. Write the steps to create the email.
2. Write the steps to search the details about historical places in internet.
3. Write the steps to create a mail and send it your friend.
4. Write the steps to create a mail which should attach some data and send it to your friend.

SEM/YEAR	**: I SEM/1st Year**
COURSE CODE	**: 20VC108**
TITLE OF THE COURSE	**: PC hardware LAB**
L: T/A: P: C	**: 0: 0: 12: 6**

List of experiments:

1. Basic Health & Safety Practices
2. Discussion about basic concepts & terminologies used in PC's
3. Evolution of Microprocessors
4. Identification of various Motherboards, Add-on cards & I/O connectors
5. Study of Bus & Memory technologies.
6. Dis-assembly & Assembly of an AT & ATX system.
7. Usage of CMOS setup & familiarization of user manual
8. Installation of Hard disk drive using various utilities
9. Installation of Operating systems such as Windows 7,8,10, Windows Server with ADS, Linux as a dual boot and Virtualization in VMware), Device drivers & application software.
10. Study of Keyboard, Mouse & Floppy disk drives
11. Tools for System Management and Troubleshooting of PC
12. PC Optimization utilities & Antivirus packages
13. Study of Monitors & Display cards
14. Study of Printers.
15. Overview of Compact Discs & Drives, Scanner & Modem
16. Discussion about preventive maintenance & the tools required
17. Study of Networking Basics
18. Overview of Laptop Technologies
19. Discussion of Emerging trends in IT & the system configuration for best buy

SEM/YEAR	**: II SEM/1st Year**
COURSE CODE	**: 20VC201**
TITLE OF THE COURSE	**: Computer Networks - I**
L: T/A: P: C	**: 2: 0: 0: 2**

Course objectives

Upon completion of this subject, the trainee will be able to:

- Explain network technologies and explain how devices access local and remote network resources.
- Describe router hardware and Explain how switching operates in a small to medium-sized business network. Design an IP addressing scheme to provide network connectivity for a small to mediumsized business network.
- Configure initial settings on a network device and implement basic network connectivity between devices.
- Configure monitoring tools available for small to medium sized business networks.
- Determine how a router will forward traffic based on the contents of a routing table
- Use monitoring tools and network management protocols to troubleshoot data networks
- Configure Ethernet switch ports and Implement VLANs.
- Implement static routing and RIPv2 and Implement DHCP on a router.
- Implement network address translation (NAT) and Implement access control lists (ACLs) to filter traffic.

Unit 1 **(6hrs)**

Introduction to Networks: What is a network? Real world networks, The OSI seven-layer model, **Network Protocols and Standards:** Communications and network protocols and the OSI model, Protocols in real world networks, The Internet

Unit 2 **(6hrs)**

Wireless Networking Standards: Wireless devices, Wireless networking standards, Issues for wireless networks, Wireless networking protocols, **Network Topology and Architecture:** Network topology concepts, Common network topologies and their application, Topologies and protocols

Unit 3 **(6hrs)**

Network Media and Connectors: Network media, Network connectors, selecting media and connectors, **Network Hardware:** Network hardware, Hardware selection, creating a network

Unit 4 **(6hrs)**

Wireless Network Hardware: Wireless network hardware, Wireless hardware selection creating a wireless network, Security Software, Network security threats, Security countermeasures Security software, Firewalls, Functions of a firewall, Types of firewall

Unit 5 **(6hrs)**

Network and Server Software: Network software requirements, Wireless network software requirements, Configuring network software Voice over IP and, Video Conferencing Voice over IP (VoIP), Video conferencing, Installing and configuring voice and video networks **Virtual Private Networks:** Virtual private networks (VPN), Advantages and disadvantages of VPN

Reference Books: Computer Networks III and IV Edition – Andrew S. Tanenbaum, PHI

SEM/YEAR	**: II SEM/1st Year**
COURSE CODE	**: 20VC202**
TITLE OF THE COURSE	**: Python**
L: T/A: P: C	**: 3: 0: 0: 3**

Course objectives

- Master the fundamentals of writing Python scripts.
- Learn core Python scripting elements such as variables and flow control structures.
- Discover how to work with lists and sequence data.
- Write Python functions to facilitate code reuse.
- Use Python to read and write files.
- Make their code robust by handling errors and exceptions properly
- Work with the Python standard library
- Explore Python's object-oriented features
- Search text using regular expressions

Course outcomes

- Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python
- Interpret Object oriented programming in Python
- Design and develop Client Server network applications using Python

Unit 1: Introduction to Python **(9 Hrs)**

History and Features of Python, Installing Python, Very Simple Programs, Variables, Python Data types and Operators: Python data types, Numbers, Python Strings, Functions and methods, Lists, working with list, Functions and methods, Tuples, working with tuples, Functions and methods, Dictionaries, working with dictionary, Functions, Python Basic operators, Python Program Flow Control: Conditional and control statements, Loops, For Loops in ranges, string, list and directory

Unit 2: Python Functions, Modules and Packages **(9Hrs)**

Calling a function, Types of functions ,Function Arguments ,Anonymous functions, Global and local variables, Importing module, Importing own module as well as external modules, Packages, Composition, Powerful Lambda function in python. Python Input, Output and File operations: Printing on screen, Reading data from keyboard, Opening and closing files, Reading and writing Files, Renaming and deleting file. Manipulating file pointer using seeks. Exception Handling: Exceptions, Assertions in Python, Exception Handling, try, except clause and try-finally clause

Unit 3: Python Object Oriented Programming – Oops **(9Hrs)**

OOPs concepts, Classes and objects, Attributes, Inheritance, Overloading, Overriding, Data Hiding, Encapsulation and polymorphism. Regular Expressions: Character matching and searching in regular expressions, Extracting data using regular expressions, Regular Expression modifiers, Patterns. CGI Programming: CGI,CGI architecture, Environment variable, CGI Examples, HTTP Header, GET and POST methods

Unit 4: Databases **(9Hrs)**

Introduction, database connection, executing queries, performing transactions Networking: Socket, Socket Module, Methods, Client and server, Internet modules. Sending Email: Sending Email using SMTP, Sending an HTML e-mail using Python, Sending Attachments as an E-mail

Unit 5: GUI programming **(9 Hrs)**

Python - GUI Programming (Tkinter), Tkinter Programming, Tkinter Widgets, Attributes. Web Scraping: Project: mapIt.py with the web browser Module, Downloading Files from the Web with the requests Module, Saving Downloaded Files to the Hard Drive. Working with Excel Spreadsheets: Installing the openpyxl Module, Reading Excel Documents. Working with PDF and Word Documents: Read PDF Documents, Extracting Text from PDFs, Decrypting PDFs, Creating PDFs

Text Books:

1. Kenneth A. Lambert, The Fundamentals of Python: First Programs, 2011, Cengage Learning,
2. Learning Python 2nd edition by MARK LUTZ, David Ascher, O; Reilly Publications
3. Python Programming: A Complete Guide for Beginners to Master, Python Programming Language by Brain Draper

SEM/YEAR	**: II SEM/1st Year**
COURSE CODE	**: 20VC203**
TITLE OF THE COURSE	**: Mathematics II**
L: T/A: P: C	**: 2: 0: 0: 2**

Course objectives

Upon successful completion of this course, the trainee will be able to analyse and apply mathematical equations

- Solve mathematically technical problems and apply the concepts of Mathematics to engineering problems
- Awareness of correlation and regression.
- Know the basic concepts of statistics.
- Understand and use concepts of Integration and Differential Equations and its applications
- Know the solution of percentage, ratios and proportions

Course outcomes

- Solve system of Probability and Statistics
- Solve problem of Analytical Geometry
- Describe and Develop Correlation and Regression analysis model

Unit 1: RATIOS, PERCENTAGE AND PROPORTIONS **(02 Hrs)**

Ratios, proportion and percentage

Unit 2: ANALYTICAL GEOMETRY **(05Hrs)**

Rectangles and Squares, Parallelogram, Triangle, Rhombus, Trapezium, Circle, Sector and Arc, Cartesian Co-Ordinates, Equation of axis, Distance, Midpoint, Slope, Condition for Perpendicularity and parallelism, Equation of straight line

Unit 3: INTEGRALCALCULUS AND DIFFERENTIAL EQUATIONS **(9Hrs)**

Integrals of functions, Rules of Integration, Integration by parts. Definite Integrals. Area under plane curves – simple problems. Differential equations

Unit 4: CORRELATION AND REGRESSION **(06 Hrs)**

Meaning of correlation and Regression, Correlation Analysis, Regression Analysis, Simple Linear Regression

Unit 5: PROBABILITY AND DISTRIBUTION **(8Hrs)**

Probability, Sample and Event Space, Conditional Probability, Data Types, Uniform Distribution, Normal Distribution, Binomial Distribution, Poisson distribution.

Text Books:

1. Thomas, Weir and Hass(2009), Thomas's Calculus, Twelfth edition, Pearson, India
2. Goon A.M., Gupta M.K. &Dasgupta B: Fundamentals of Statistics, Vol. 1, The World Press Pvt. Ltd., Kolkata.
3. Thomas's Calculus, G.B.Thomas, M.Weir, J. Hass, Pearson , 12th edition

SEM/YEAR	**: II SEM/1st Year**
COURSE CODE	**: 20VC204**
TITLE OF THE COURSE	**: C- Programming**
L: T/A: P: C	**: 2: 0: 0: 2**

Course objectives

- use data types ,operators and expressions in writing ' C ' Programmer;
- use function; external variables, multiple source files and also processors
- pointers approximately in the ' C ' Program
- employ the standard library in developing in C program

Unit 1 **(6 Hrs)**

Introduction to Programming, Program and Programming Languages, Types of software's, Compiler and Interpreter, Overview of C, Introduction, Importance of C, Sample C program with inbuilt Library functions, Basic structure of C program, Programming style, Execution of C program in Unix and Turbo C

Unit 2 **(6 Hrs)**

Constants, Variables and Data Types: Character set, C tokens, Keywords and identifiers, Constants, variables and data types Declaration of variables, Assigning values to variables, Declaring a variable as constant, volatile, Operators and Expressions: Arithmetic operators, Relational operators Logical operators, Assignment operators Increment and decrement operators Conditional operators Bitwise operators, Special operators, Precedence of arithmetic, relational & logical operators Arithmetic expressions Evaluation of expressions, Operators precedence and associativity Mathematical functions

Unit 3 **(6 Hrs)**

Managing Input and Output Operations : Reading a character , Writing a character, Formatted input & output , Decision Making, Branching and Looping: Decision making with IF statement, Simple IF statement, The IF...Else statement, Nesting of IF...Else statement, The Else If ladder, The Switch statement, The WHILE statement, The DO... statement, The FOR statement, Jump statements Continue, break, return and GOTO, Arrays: One-dimensional arrays- Declaration and initialization of one dimensional array, Two-dimensional arrays- Declaration and initialization Of two dimensional array, Multidimensional arrays, Sample programs using arrays

Unit 4 **(6 Hrs)**

Handling of Character-Strings: Declaring and initializing string variables, Reading strings from terminal, Writing strings to screen, Arithmetic operations on characters, Putting strings together, String-handling functions, User-Defined Functions: Need for user-defined functions, Elements of user defined function - Function declaration., Definition of functions, Return values and their types, Calling a function, Category of functions: No arguments and no return values, Arguments but no return values, Arguments with return values, No Arguments but returns a value. Nesting of functions, Recursion, Functions with arrays -

Passing 1-D array to a function, Passing 2-D array to a function, Storage Class - Automatic storage class, Register storage class, Static storage class, External storage class

Unit 5 **(6 Hrs)**

Structures and Unions: Structure definition, Declaring structure variables, Accessing structure members. Structure initialization, Structure Operations - Copying of structure variables, Comparison of two structure variables or members, Arithmetic operations on structures, Structures and Arrays, Structures within Structures, Structure and functions, Passing individual structure members to functions, Passing a whole structure to functions, Unions, Difference between structure and unions, Pointers: Understanding pointers, The & and * operators, Declaration and initialization of pointers, Accessing a variable through its pointer, Chain of pointers, Pointer increment and scale factor.

REFERENCE BOOKS:

1. ANSI C By BALAGURUSWAMY
2. Let Us C By Yashwant Kanetkar
3. Computer Concepts and C Programming by P B Kotu

SEM/YEAR	**: II SEM/1st Year**
COURSE CODE	**: 20VC205**
TITLE OF THE COURSE	**: Data Base**
L: T/A: P: C	**: 3: 0: 0: 3**

Course objectives

Upon successful completion of this subject, the trainee will be able to

- Understand the Database concepts
- Design the database with planning and coding
- Normalize the database
- Administration of data and data base
- Solve queries related to the database

Course outcomes

- Ability to Install, configure, and interact with a relational database management system
- Ability to master the basics of SQL and construct queries using SQL
- Ability to design and develop a large database with optimal query processing

Unit 1: Introduction to Database System **(8 Hrs)**

File System versus a DBMS, Purpose of Database system, Database Applications, Basic concepts and definitions

Unit 2: Data Models **(9 Hrs)**

Entity-Relationship Model, Object Oriented Model, Network Model, Hierarchical Model, Relational Model. **Normalization:** What is Normalization? First Normal form, Second Normal form, Third Normal form, Boyce-codd Normal Form

Unit 3: SQL **(10 Hrs)**

Introduction to SQL, DDL Commands, DML Commands, DCL Commands, TCL Commands, User defined data type, Where Clause operators, Order By, Group By, Having Clauses, DISTINCT, TOP Keywords, Aggregate functions, Built-in functions-numeric, string and Date Functions

Unit 4: Advance SQL **(9 Hrs)**

SQL Constraints, Sub Queries, Identity column, SQL Joins, Views, Index, Triggers

Unit 5: Transact-SQL **(9 Hrs)**

Stored Procedure, Function, Control Structures, Conditional Processing using IF statements, While loop, Exception handling by TRY...CATCH, Error functions used within CATCH block

DATA ADMINISTRATION

Database Administrator, Concurrency control, Database Recovery, Database Security

Reference Books:

1. SQL Server 2008 r2 - Black Book
2. SQL Server – Patrick Paul
3. SQL Server 2008 programming – Robert vieira
4. J. Date, A. Kannan and S. Swamynathan, "An Introduction to Database Systems", 8thed, Pearson Education, 2006
5. Raghu Ramakrishnan, "Database Management Systems", Third Edition, McGraw Hill, 2003

SEM/YEAR	**: II SEM/1st Year**
COURSE CODE	**: 20VC206**
TITLE OF THE COURSE	**: SQL Server 2008 Lab**
L: T/A: P: C	**: 0: 0:12: 6**

LIST OF PROGRAMS:

1. Demo on Creating Databases
2. Demo on Modify Databases
3. Demo on database and files Viewing a Database
4. Demo on Renaming a Database
5. Demo on Deleting Database
6. Demo on database and files
7. Demo on database and files groups
8. Creating tables with different Data types
9. Demo on altering the table
10. Creating tables with User Defined Data Types
11. Dropping User Defined Data Types
12. Demo on Data Manipulation Language with different types Inserting values
13. Demo on Data Manipulation Language with different types updating values
14. Demo on Data Manipulation Language with different types Deleting Rows
15. Demo on Truncating a Table
16. Demo on Deleting a Table
17. Writing a Basic select statement
18. Writing a Basic select statement using where clause
19. Write a query to perform Arithmetic Operations
20. Write a query to perform Relational operators
21. Write a query to perform Logical operators
22. Write a query to perform Special operators
23. Generate query using TOP and DISTINCT keywords
24. Generate query to perform ORDER BY clause
25. Generate query to perform GROUP BY and HAVING clauses
26. Generate query using String functions
27. Generate query using Date functions
28. Generate query using Mathematical Functions

29. Generate query using Aggregate functions
30. Creating tables with different types of Constraints
31. Perform demo on Correlated Sub queries
32. Perform demo on sub queries with Operators
33. Generate a query to create an identity column
34. Perform demo on Cross Join
35. Perform demo Natural Join
36. Perform demo Equi Join
37. Perform demo on inner Join
38. Perform demo on outer Join
39. Write a query to creating Views
40. Write a query to retrieve Results from Views
41. How to Altering Views
42. Write a query to Dropping Views
43. Write a query to Renaming Views
44. Write a query to Manipulating Data through Views
45. Write a query to Implementing Indexes with different types of indexes
46. Creating Triggers
47. Write programs to declare different types of variables with different data types
48. Write program to Printing Messages
49. Write program to Implementing Stored Procedures
50. Write program on Types of Stored Procedures
51. Write program on Types of Parameters
52. Demo on Altering a Stored Procedure
53. Demo on how to Viewing a Stored Procedure
54. Demo on Deleting a Stored Procedure
55. Write a program to Create a function
56. Demo on IF statement
57. Demo on WHILE loop
58. Demo on exception handling
59. Demo on Explicit Transaction
60. Demo on Implicit Transactions

Reference Books:

- SQL Server 2008 r2 - Black Book
- SQL Server – Patrick Paul
- SQL Server 2008 programming – Robert vieira

Reference Website:

- www.msdn.microsoft.com
- www.tutorialspoint.com
- www.techonthenet.com

SEM/YEAR	**: II SEM/1st Year**
COURSE CODE	**: 20VC207**
TITLE OF THE COURSE	**: C – Programming & Python Lab**
L: T/A: P: C	**: 0: 0:12: 6**

LIST OF PROGRAMS:

C Programming

- **INTRODUCTION AND DATA TYPES**
  1. Write a program in C language to display 'hello world'. Analyze Sub main (), compilation and execution process of a C program.
  2. Write a program in C language to perform arithmetic operation like +, - , X, / and % and display the result.
  3. By declaring int type variables.
  4. By declaring float type variables
  5. Write a program in C language to calculate the area of the circle. Formula for calculating area of a circle A is A=πr2 where r is the radius and π is a constant.

- **DECISION MAKING AND LOOPING**

1. Write a program in C language to find whether an input number is even or odd.
2. Write a program in C language to check whether an entered alphabet is vowel, consonant, digit or special character.
3. Write a program in C language to print counting numbers from 1 to 100 using 'for loop'
4. Write a program in C language to find the sum of digits of an input number less than 99999.
5. Write a program in C language to display a menu as given below and Execute arithmetic operations. Use switch case.
   Menu
   Addition 1
   Subtraction..... 2
   Multiplication 3
   Division 4
   Module Termination 0
   Enter your choice ..... (0/1/2/3/4)

- **ARRAY**

1. Create an array and store data into the array and print the same.
2. Write a C program to accept an array and search for an element.
3. Write a C program to create an arrays and sort in descending order and ascending order.
4. Write a C program to perform a transpose of a matrix.

- **STRING**

1. Write a C program to read text and display it
2. Write a C program to accept a string and find the number of vowels and displayit
3. Write a C program to find the length, concatenate, copy of the string using non built in function
4. Write a C program to check whether the string is palindrome or not

- **FUNCTION**

1. Write a function LEAP_YEAR() that receives year as a parameter and display proper message, that the particular year is leap year or not
2. Write a recursive function to calculate the factorial of a number.

- **STRUCTURE**

1. Write a C program to illustrate the comparison of two structure variables and print equal or not taking individual members.
2. Write a program to add two times using structure.

- **POINTER AND FILE**

1. Write a program to create a pointer variable and display the address and value using pointer variable.
2. Create a file write some content into the file and read the content of the file and display it on monitor.

Python

Introduction to Python

1. Write a python program to find the square Root
2. Write a python program to calculate the Area of a Triangle
3. Write a python program to solve quadratic Equation
4. Write a python program to swap Two Variables

Python Data types and Operators

1. Write a python program to sum all the items in a list.
2. Write a python program to program to add two matrices
3. Write a python program to multiply two matrices
4. Write a python program to check Whether a string is palindrome or not
5. Write a program to demonstrate operators in python

Python Program Flow Control

1. Write a python program to check if a number is positive, negative or zero
2. Write a python program to check prime number
3. Write a python program to find the factorial of a number
4. Write a python program to display the multiplication Table
5. Write a python program to print the Fibonacci series
6. Write a python program to check Armstrong number

Python Functions, Modules And Packages

1. Write a python program to find numbers divisible by another number by using functions.
2. Write a python program to find factors of number
3. Write a python program to find factorial of number using recursion
4. Write a python program to display powers of 2 using anonymous function
5. Write a python program to find Factors of Number by importing module.
6. Write a python program to demonstrate calculator using package

Python Input, Output and File operations

- Write a python program to read from one file and copy to another file.
- Write a python program to rename and delete the file
- Write a python program to demonstrate input and raw_input functions.

Exception Handling

1. Write a python program to perform zero division error.
2. Write a python program to demonstrate exception handling while opening a file where you do not have write permission.

Python Object Oriented Programming – Oops

1. Write a python program to demonstrate on creating a class, creating instance objects and accessing attributes
2. Write a python program to demonstrate Inheritance.
3. Write a python program to demonstrate Overriding
4. Write a python program to demonstrate Overloading

Regular Expressions

1. Write a Python program to check that a string contains only a certain set of characters(a-z, A-Z and 0-9).
2. Write a Python program that matches a string that has an a followed by zero or more b's and an a followed by three 'b'
3. Write a Python program that matches a word at the beginning of a string
4. Write a Python program to check for a number at the end of a string.
5. Write a Python program to remove leading zeros from an IP address.
6. Write a Python program to replace all occurrences of space, comma, or dot with a colon.

CGI Programming

1. Write a CGI program to pass values using HTML form and submit button by GET and POST Method

Databases

1. Write a python program to create a database and perform insert operation
2. Write a python program to perform update operation on database
3. Write a python program to perform delete operation on database

SEM/YEAR	**: II SEM/1st Year**
COURSE CODE	**: 20VC208**
TITLE OF THE COURSE	**: Networking Lab**
L: T/A: P: C	**: 0: 0:12: 6**

LIST OF PROGRAMS:

Navigate the IOS
-Explore EXEC Modes
-Set the Clock

Configure Initial Switch Settings
-Host Name -Banner MOTD
-Save Configuration Files to NVRAM

Configure Initial Switch Settings
-Verify the Default Switch Configuration
-Enable Password -Enable Secret
-Configure Line Passwords
-Encrypt all plain text passwords
-Save Configuration Files to NVRAM

Implement Basic Connectivity
-Perform a Basic Configuration on Switch
-Configure the PCs
-Configure the Switch Management Interface

Connect a Wired and Wireless LAN

Configure Initial Router Settings
-Verify the Default Router Configuration
-Configure and Verify the Initial Router Configuration
-Save the Running Configuration File

Connect a Router to a LAN
-Display Router Information
-Configure Router Interfaces
-Verify the Configuration

Configure IPv6 Addressing
-Configure IPv6 Addressing on the Router
-Configure IPv6 Addressing on Clients
-Test and Verify Network Connectivity

Configure Secure Passwords and SSH

Verify Directly Connected Networks
-Verify IPv4 Directly Connected Networks

-Verify IPv6 Directly Connected Networks

VLAN Configuration
-Verify the Default VLAN Configuration
-Configure VLANs
-Assign VLANs to Ports

Configure Trunks
-Configure & Verify VLANs
-Configure Trunks

Configure DTP
-Configure static trunking
-Configure and Verify DTP

Configure Router-on-a-Stick Inter-VLAN
-Add VLANs to a Switch
-Configure Sub interfaces
-Test Connectivity with Inter-VLAN Routing

Configure Layer 3 Switching and Inter-VLAN Routing
-Configure Layer 3 Switching
-Configure Inter-VLAN Routing
-Configure IPv6 Inter-VLAN Routing

Configure Ether Channel
Configure Basic Switch Settings
Configure an Ether Channel with Cisco PAgP

Configure Ether Channel
Configure Basic Switch Settings
Configure an 802.3ad LACP Ether Channel

Configure DHCPv4
-Configure a Router as a DHCP Server
-Configure DHCP Relay
-Configure a Router as a DHCP Client
-Verify DHCP and Connectivity

Configure DHCPv6
-Configure and verify a Stateless DHCPv6 Server
-Configure and verify a State full DHCPv6 Server
-Configure and verify a DHCPv6 Relay

HSRP Configuration
-Configure an HSRP active router.
-Configure an HSRP standby router.
-Verify HSRP operation.

SCHEME AND SYLLABUS FOR

B.VOC IN COMPUTER ENGINEERING AND IT INFRASTRUCTURE. AY: 2020-2021

3rd Semester

SL	PROGRAM CODE	COURSE CODE	TITLE OF THE COURSE	CREDITS	HOURS
GENERAL EDUCATION COMPONENTS : 12 CREDITS, 180HOURS					
1	P007	20VCXXX	Data structures with C	2	30
2	P007	20VCXXX	OOP'S with C++	2	30
3	P007	20VCXXX	Computer Networks-II	2	30
4	P007	20VCXXX	Microprocessor & Micro Controller	2	30
5	P007	20VCXXX	Operating System	2	30
6	P007	20VCXXX	Computer Organization	2	30
SKILL COMPONENTS : 18 CREDITS , 270 HOURS					
7	P007	20VCXXX	OOP'S with C++ Lab	5	75
8	P007	20VCXXX	Data structures with C Lab	4	60
9	P007	20VCXXX	Computer Networks-II Lab	4	60
10	P007	20VCXXX	Microprocessor & Micro Controller Lab	5	75
Audit Course					
11	P007	20VCXXX	Constitution of India and Ethics		

4th Semester

SL	PROGRAM CODE	COURSE CODE	TITLE OF THE COURSE	CREDITS	HOURS
GENERAL EDUCATION COMPONENTS : 12 CREDITS, 180HOURS					
1	P007	20VCXXX	Software Engineering	2	30
2	P007	20VCXXX	Java Programming	2	30
3	P007	20VCXXX	Windows Server Administration & Linux Server Administration	2	30
4	P007	20VCXXX	IoT	2	30
5	P007	20VCXXX	Web Programming (JavaScript, Perl, PHP, Python)	2	30
6	P007	20VCXXX	Design and Analysis of Algorithms	2	30
SKILL COMPONENTS : 18 CREDITS , 270 HOURS					
7	P007	20VCXXX	Web Programming (Java Script, Perl, PHP, Python) Lab	5	75
8	P007	20VCXXX	Windows Server Administration & Linux Server Administration LAB	4	60
9	P007	20VCXXX	JAVA Programming Lab	5	75
10	P007	20VCXXX	IoT Lab	4	60
Audit Course					
11	P007	20VCXXX	Kannada Language		

3rd Semester

SEM/YEAR : III SEM/2nd Year
COURSE CODE : 20VCXXX
TITLE OF THE COURSE : Data structures with C
L: T/A: P: C : 2: 0: 0: 2

OBJECTIVE

- Learning program independent view of data structures, including its representation and
- Operations performed on them, which are then linked to sorting, searching and indexing
- Methods to increase the knowledge of usage of data structures in algorithmic perspective

UNIT I: LINEAR DATA STRUCTURES 6 Hrs

Abstract Data Types - Asymptotic Notations: Big-Oh, Omega and Theta – Best, Worst and Average case Analysis: Definition and an example – Arrays and its representations – Stacks and Queues – Linked lists – Linked list based implementation of Stacks and Queues – Evaluation of Expressions – Linked list based polynomial addition.

UNIT II: NON-LINEAR DATA STRUCTURES 6 Hrs

Trees – Binary Trees – Binary tree representation and traversals – Threaded binary trees – Binary tree representation of trees – Application of trees: Set representation and Union-Find operations – Graph and its representations – Graph Traversals – Connected components.

UNIT III: SEARCH STRUCTURES AND PRIORITY QUEUES 6 Hrs

AVL Trees – Red-Black Trees – Splay Trees – Binary Heap – Leftist Heap

UNIT IV: SORTING 6 Hrs

Insertion sort – Merge sort – Quick sort – Heap sort – Sorting with disks – k-way merging – Sorting with tapes – Poly-phase merge

UNIT V: SEARCHING AND INDEXING 6 Hrs

Linear Search – Binary Search - Hash tables – Overflow handling – Cylinder Surface Indexing – Hash Index – B-Tree Indexing.

TEXT BOOKS:

1. Ellis Horowitz and Sartaj Sahni, Fundamentals of Data Structures, Galgotia Book Sorce,

Gurgaon, 1976.

2. Gregory L. Heilman, Data Structures, Algorithms and Object Oriented Programming,

Tata Mcgraw-Hill, New Delhi, 2002.

REFERENCES:

1. Jean-Paul Tremblay and Paul G. Sorenson, An Introduction to Data Structures with Applications, Second Edition, Tata McGraw-Hill, New Delhi, 1991.
2. Alfred V. Aho, John E. Hopcroft and Jeffry D. Ullman, Data Structures and Algorithms, Pearson Education, New Delhi, 2006.

SEM/YEAR	**: III SEM/2nd Year**
COURSE CODE	**: 20VCXXX**
TITLE OF THE COURSE	**: OOP'S with C++**
L: T/A: P: C	**: 2: 0: 0: 2**

Course Objectives

To learn the basic principles of object-oriented programming paradigm using C++

Course outcomes

Students will be able to:

1. Identify classes with attributes and functions for given problem
2. Analyze the relationship between the classes link them using appropriate concepts
3. Design and implement abstract data types.
4. Devise generic classes capable of manipulating primitive and user defined data types.

UNIT 1 **6hrs**

Programming Paradigms - Introduction to OOP – Overview of C++ - Classes – Structures – Union – Friend Functions – Friend Classes – Inline functions – Constructors – Destructors –Dynamic Initialization of Objects - Static Members – Passing objects to functions – Function returning objects-Arrays of Objects, Object as Function Arguments

UNIT 2 **6hrs**

Arrays – Pointers – this pointer – References – Dynamic memory Allocation – functions Overloading – Default arguments – Overloading Constructors – Pointers to Functions – Operator Overloading - Type Conversion.

UNIT 3 **6hrs**

Inheritance – Types - Derived Class Constructors- Issues in Inheritance – Virtual base Class – Polymorphism – Virtual functions – Pure virtual functions

UNIT 4 **6hrs**

Class templates and generic classes – Function templates and generic functions – Overloading function templates – power of templates – Exception Handling – Derived class Exception – over handling generic functions – Exception handling Functions

UNIT 5 **6hrs**

Streams – Formatted I/O with IOS class functions and manipulators –File I/O – Name spaces – Array based I/O – Error handling during file operations - Formatted I/O – STL: Overview-Container Classes Lists-Maps- Algorithms Using Functions and Objects-String Class - Sequence Containers, Iterators-Specialized Iterators - Associative Containers. Storing User- Defined Objects - Function Objects

Text Books

1. Stephen Prata,"C++ Primer Plus", 6th Edition ,Addison-Wesley Professional, 2011

2. BjarneStroustrup, "Programming: Principles and Practice Using C++,1st Edition, Addison-Wesley Professional, 2008

Reference Books

1. Andrew Koenig and Barbara E. Moo, "Accelerated C++: Practical Programming by Example", 1st Edition, Addison-Wesley Professional, 2000

2. Bruce Eckel ,"Thinking in C++: Introduction to Standard C++: Volume One" 2nd Edition,PrenticeHall, 2000

3. Andrei Alexandrescu , "Modern C++ Design: Generic Programming and Design PatternsApplied" , 1st Edition, Addison-Wesley Professional, 2001

SEM/YEAR : **III SEM/2nd Year**
COURSE CODE : **20VCXXX**
TITLE OF THE COURSE : **Computer Networks-II**
L: T/A: P: C : **2: 0: 0: 2**

Course Objectives

- To introduce the fundamental aspects of various types of computer networks
- To demonstrate the TCP/IP and OSI models with merits and demerits.

Course outcomes

- At the end of the course
- Students should be understand and explore the basics of Computer Networks and Various Protocols
- He/She will be in a position to understand the World Wide Web concepts
- Students will be in a position to administrate a network and flow of information
- Further he/she can understand easily the concepts of network security, mobile And ad hoc networks

UNIT 1 **6hrs**

Overview of the Internet: Protocol, Layering Scenario, TCP/IP Protocol Suite: The OSI Model, Internet history standards and administration; Comparison of the OSI and TCP/IP Reference model, Physical Layer: Introduction to Guided transmission media and wireless transmission Media, Transmission mode, Classification of networks Parallel & Serial Transmissions, Analog & Digital Signals, Periodic & Aperiodic Signals, Nyquist criteria and Shannon theorem Modulation---Amplitude Modulation, Frequency Modulation, Phase Modulation Data Link Layer - Design issues, CRC codes, Elementary Data Link Layer Protocols, stop and wait, sliding window, go-back-N protocols .

UNIT 2 **6hrs**

Multi Access Protocols - ALOHA, CSMA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer, data link layer switching & use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.

UNIT 3 **6hrs**

Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Control to Infinity Problem, Hierarchical Routing, Congestion control algorithms, admission control.

UNIT 4 **6hrs**

The Internet Transport Protocols: UDP,RPC, Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP

UNIT 5 **6hrs**

Application Layer- Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS, SSH, SNMP, Socket Programming

Text Books

1. Behrouz A. Forouzan, Data Communications and Networking -, Fifth Edition TMH,

2013.

2. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

Reference Books

1. W. Tomasi, “Advanced Electronic Communication Systems”, 2000

2. James Martin, “Telecommunications & the Computer”, 3rd Edition, PHI. 2001

3. P. C. Gupta, “Data Communications, PHI, 2001.

SEM/YEAR : **III SEM/2nd Year**
COURSE CODE : **20VCXXX**
TITLE OF THE COURSE : **Microprocessor & Micro Controller**
L: T/A: P: C : **2: 0: 0: 2**

Course Objectives

1. To introduce microprocessors and basics of system design using microprocessors.
2. To introduce h/w architecture, instruction set and programming of 8086 microprocessor
3. To introduce the peripheral interfacing of microprocessors.
4. To introduce the h/w architecture, instruction set, programming and interfacing of 8051 microcontroller

Course outcomes

At the end of the course student will be able

1. To Know the basics of system design using microprocessors.
2. To implement the h/w architecture, instruction set and programming of 8086 Microprocessor
3. To implement peripheral interfacing of microprocessors.
4. To know the h/w architecture, instruction set, programming and interfacing of 8051 microcontroller

UNIT 1 **6hrs**

INTRODUCTION TO MICROPROCESSOR

Introduction-Evolution of Microprocessor, The Microprocessor-Based Personal Computer Systems, The Microprocessor and its Architecture: Introduction and difference between 8085 and 8086 microprocessor.8086 pin diagram, Minimum mode maximum Mode

UNIT 2 **6hrs**

8086 ARCHITECTURE

Internal Architecture of 8086,Registers, Addressing Modes-Immediate addressing, Register addressing, direct addressing, indirect addressing, relative addressing, Memory Paging, Flat Mode Memory Addressing Modes

UNIT 3 **6hrs**

PROGRAMMING 8086

Data Movement Instructions: MOV Revisited, PUSH/POP, Load-Effective Address, String Data Transfers, Miscellaneous Data Transfer Instructions, Arithmetic and Logic Instructions: Addition, Subtraction and Comparison, Multiplication and Division, BCD and ASCII Arithmetic, Basic Logic Instructions, Shift and Rotate, String Comparisons. Program Control Instructions: The Jump Group, Controlling the Flow of the Program, Bit manipulation instruction.

UNIT 4 **6hrs**

I/O INTERFACING

Memory Interfacing and I/O interfacing –8255 pin diagram, Parallel communication interface – Serial communication interface – Timer – Keyboard /display controller – Interrupt controller – DMA controller –Applications.

UNIT 5 **6hrs**

8051 MICROCONTROLLERS

Architecture of 8051 – Pin Diagram of 8051, Operational features – Memory and I/O addressing – Interrupts – Instruction set – Applications.

Text Books

1. Douglas V Hall, "MICROPROCESSORS AND INTERFACING, PROGRAMMING AND HARDWARE" TMH, 2006.
2. Barry B Brey: The Intel Microprocessors, 8th Edition, Pearson Education, 2009

Reference Books

1. Krishna Kant, "MICROPROCESSORS AND MICROCONTROLLERS Architecture, programming and system design using 8085, 8086, 8051 and 8096". PHI 2007.
2. Mohammed Rafiquzzaman, Microprocessors and Microprocessor Based Systems, 2nd Edition CRC Press, 2000
3. Muhammad Ali Mazidi, Janice GillispieMazidi, RolinD.MCKinlay The 8051 Microcontroller and Embedded Systems, Second Edition, Pearson Education 2008.
4. Kenneth J. Ayala, "The 8086 Microprocessor: Programming & Interfacing The PC", Delmar Publishers, 2007.

SEM/YEAR : **III SEM/2nd Year**
COURSE CODE : **20VCXXX**
TITLE OF THE COURSE : **Operating System**
L: T/A: P: C : **2: 0: 0: 2**

Course Objectives

1. To tell the students the how the operating system is making computer system more Convenient
2. How to efficiently utilize the computer resources.

Course outcomes

At the end of the course student will be able to

1. Understand functions, structures and history of operating systems
2. Master understanding of design issues associated with operating systems
3. Master various process management concepts including scheduling, synchronization, Deadlocks, file sharing.

UNIT 1 **6hrs**

Computer System and Operating System Overview: Overview of computer system, Over View of Operating Systems, operating systems functions protection and security distributed systems special purpose systems operating systems structures, Operating System Services and systems calls, Virtual Machines, Operating System Design and Implementation, operating systems generation

UNIT 2 **6hrs**

Process Management – Process concepts, threads, scheduling-criteria algorithms, their evaluation, thread scheduling. Concurrency: Process synchronization, the critical- section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors.

UNIT 3 **6hrs**

Principles of deadlock – system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock, Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table , segmentation, virtual memory, demand paging, page-Replacement, algorithms, case studies UNIX

UNIT 4 **6hrs**

I/O systems, Hardware, application interface, kernel I/O subsystem, Transforming IO requests, Hardware operation, STREAMS, performance. File system Interface- the concept of a file, Access Methods, Directory structure, File system mounting, and file sharing, protection. File System implementation- File system structure, file system implementation, directory implementation, directory implementation, allocation methods, free-space management, efficiency and performance.

UNIT 5 **6hrs**

Protection: Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language–Based Protection, Security- the Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks, computer –security classifications. Introduction to Mass-storage structure: NAS and SAN.

Text Books

1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Operating systems- A Concept based Approach-D.M.Dhamdhere, 2nd Edition, TMH.

Reference Books

1. Operating Systems' – Internal and Design Principles Stallings, Fifth Edition–2005, Pearson education/PHI
2. Operating System A Design Approach-Crowley, TMH.
3. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI.

SEM/YEAR : **III SEM/2nd Year**
COURSE CODE : **20VCXXX**
TITLE OF THE COURSE : **Computer Organization**
L: T/A: P: C : **2: 0: 0: 2**

Course Objectives

1. Provide in depth knowledge of designing a processor considering both the data part and control parts of a processor
2. Give students thorough knowledge of memory technology , different types of memory, I/O sub systems, and I/O operations
3. Help students understand the concept of pipeline processing, parallel architectures and multi core architectures

Course outcomes

At the end of the course student will be able

1. To design the data part and control part of a processor
2. To understand memory technology, I/O systems and I/O operation and use them i the design of a computing system
3. To understand and appreciate the pipe line processing and parallel processing

UNIT 1 **6hrs**

Basic organization of computers, Block level description of the functional units as related to the execution of a program; Fetch, decode and execute cycle. Machine instructions, Instructions set architectures, Assembly language programming, addressing modes, instruction cycles, registers and storage, addressing modes; discussions about RISC versus CISC architectures

UNIT 2 **6hrs**

Information representation, Floating point representation (IEEE754), computer arithmetic and their implementation; Data Part Design: Fixed-Point Arithmetic-Addition, Subtraction, Multiplication and
Division, Arithmetic Logic Units control and data path, data path components, design of ALU and data-path, Control Part Design: Control unit design; Hardwired and Microprogrammed Control unit

UNIT 3 **6hrs**

Memory Technology, static and dynamic memory, Random Access and Serial Access Memories, Cache memory and Memory Hierarchy, Address Mapping, Cache updating schemes, Virtual memory and memory management unit

UNIT 4 **6hrs**

I/O subsystems: Input-Output devices such as Disk, CD-ROM, Printer etc.; interfacing with IO devices, keyboard and display interfaces; Basic concepts Bus Control, Read Write operations, Programmed IO, Concept of handshaking, Polled and Interrupt-driven I/O, DMA data transfer.

UNIT 5 **6hrs**

Pipeline Processing, Instruction and Arithmetic Pipeline, Pipeline hazards and their resolution, Parallel Processing Systems, Multi-core Architectures

Text Books

1. Mano, M.M., Computer System Architecture, Prentice Hall of India, New Delhi, 1992
2. V. Carl Hamacher, Safwat G. Zaky and Zvonko G. Vranesic , Computer Organization , McGraw Hill series 2002

Reference Books

1. Hayes, J.P , Computer Architecture and Organization, McGraw-Hill, 1998
2. Vincent P. Heuring and Harry F. Jordan , Computer Systems Design and Architecture (2nd Edition), Dec, 2003
3. David Patterson and John Hennessey Computer Organization and Design, Elsevier. 2008

SEM/YEAR : **III SEM/2nd Year**
COURSE CODE : **20VCXXX**
TITLE OF THE COURSE : **OOP'S with C++ Lab**
L: T/A: P: C : **0: 0: 5: 5**

List of Experiments:

Exercise – 1 (Basics)

Write a Simple Program on printing "Hello World" and "Hello Name" where name is the input from the user

a) Convert any two programs that are written in C into C++

b) Write a description of using g++ (150 Words)

Exercise – 2 (Expressions Control Flow)

a) Write a Program that computes the simple interest and compound interest payable on principalamount(inRs.) of loan borrowed by the customer from a bank for a given period of time (in years) at specific rate of interest. Further determine whether the bank will benefit by charging simple interest or compound interest.

b) Write a Program to calculate the fare for the passengers traveling in a bus. When a Passenger enters the bus, the conductor asks "What distance will you travel?" On knowing distance from passenger (as an approximate integer), the conductor mentions the fare to the passenger according to following criteria.

Exercise – 3 (Variables, Scope, Allocation)

a) Write a program to implement call by value and call by reference using reference variable.

b) Write a program to illustrate scope resolution, new and delete Operators. (Dyanamic Memory Allocation)

c) Write a program to illustrate Storage classes

d) Write a program to illustrate Enumerations

Exercises –4 (Functions)

Write a program illustrating Inline Functions

a) Write a program illustrate function overloading. Write 2 overloading functions for power.

b) Write a program illustrate the use of default arguments for simple interest function.

Exercise -5 (Functions –Exercise Continued)

a) Write a program to illustrate function overloading. Write 2 overloading functions for adding two numbers

b) Write a program illustrate function template for power of a number.

c) Write a program to illustrate function template for swapping of two numbers.

Exercise -6 (Classes Objects)

Create a Distance class with:

- feet and inches as data members
- member function to input distance
- member function to output distance
- member function to add two distance objects

a). Write a main function to create objects of DISTANCE class. Input two distances and output the sum.

b). Write a C++ Program to illustrate the use of Constructors and Destructors (use the above program.)

c) Write a program for illustrating function overloading in adding the distance between objects (use the above problem)

d). Write a C++ program demonstrating a Bank Account with necessary methods and variables

Exercise – 7 (Access)

Write a program for illustrating Access Specifiers public, private, protected

a) Write a program implementing Friend Function

b) Write a program to illustrate this pointer

c) Write a Program to illustrate pointer to a class

Exercise -8 (Operator Overloading)

a). Write a program to Overload Unary, and Binary Operators as Member Function, and Non Member Function

i. Unary operator as member function

ii. Binary operator as nonmember function

b). Write a c ++ program to implement the overloading assignment = operator

c).Write a case study on Overloading Operators and Overloading Functions (150 Words)

Exercise -9 (Inheritance)

a) Write C++ Programs and incorporating various forms of Inheritance

i) Single Inheritance

ii) Hierarchical Inheritance

iii) Multiple Inheritances

iv) Multi-level inheritance

v) Hybrid inheritance

b) Write a program to show Virtual Base Class

c) Write a case study on using virtual classes (150 Words)

Exercise-10 (Inheritance –Continued)

a) Write a Program in C++ to illustrate the order of execution of constructors and destructors in Inheritance

b) Write a Program to show how constructors are invoked in derived class

Exercise -11 (Polymorphism)

a) Write a program to illustrate runtime polymorphism

b) Write a program to illustrate this pointer

c) Write a program illustrates pure virtual function and calculate the area of different shapes By using abstract class

d) Write a case study on virtual functions (150 Words)

Exercise -12(Templates)

a) Write a C++ Program to illustrate template class

b) Write a Program to illustrate class templates with multiple parameters

c) Write a Program to illustrate member function templates

Exercise -13 (Exception Handling)

a).Write a Program for Exception Handling Divide by zero

b). Write a Program to re throw an Exception

SEM/YEAR	**: III SEM/2nd Year**
COURSE CODE	**: 20VCXXX**
TITLE OF THE COURSE	**: Data structures with C Lab**
L: T/A: P: C	**: 0: 0: 4: 4**

List of Experiments:

1. Design a problem to search an element in two dimensional array.
2. Design a problem to perform following operations on tables using function only addition, Subtraction, Multiplication.
3. Design a program for performing various Basic elementary Operations (Push , Pop , Peek , isfull , isempty) using ARRAY on stack .
4. Design a program for performing various Basic elementary Operations (Enqueue , Dequeue , Peek etc.) using ARRAY on Queue.
5. Write a program using iteration and recursion concept for Quicksort.
6. Design a problem for Linked list creation and perform operations such as insert, delete ,update and reverse on it.
7. Design a problem to simulate following sorting algorithm.

a)Merge sort, b)Insertion Sort, c) Bubble Sort

8. Design a solution for following Search Techniques.

a)Linear Search, b)Binary Search

9. Design a Program for various Graph traversal techniques
10. Design a program for various tree traversal techniques.
11. Design a program for Binary Tree and Perform the following operations: Creation, Insertion & Traversal on the tree.
12. Implement Circular Linked list.
13. Design a program for performing various Basic elementary Operations (Push, Pop , Peek , isfull, isempty) using Linked List on Stack .
14. Design a program for performing various Basic elementary Operations (Enqueuer , Dequeue, Peek etc.) using Linked List on Queue.
15. Design a Problem to Evaluate Prefix expression.

SEM/YEAR	**: II SEM/2nd Year**
COURSE CODE	**: 20VCXXX**
TITLE OF THE COURSE	**: Computer Networks-II Lab**
L: T/A: P: C	**: 0: 0: 4: 4**

LIST OF EXPERIMENTS

1. Design and implement a C program to copy a file using command line arguments passed to a user defined function.
2. Write a C/C++ POSIX compliant program to check the following limits on the system: (i) Maximum number of characters allowed in a path name (ii) Maximum number of child processes that may be created (iii) Maximum number of characters allowed in a file name (iv) Number of clock ticks per second (v) Maximum number of files that can be opened simultaneously by a process.
3. Design and implement a C program that demonstrates interprocess communication between two processes using mkfifo, open, read, write and close APIs.
4. a) Write a C program that prints the contents of its environment list.
b) Design and implement a C program to implement the mv command in Unix using link and unlink APIs.
5. Design and implement a C program to illustrate the race condition using parent and child processes.
6. Design and implement a C program to implement the system function.

7. Design and implement C programs for both server and client to demonstrate inter-process communication using connection oriented (TCP) sockets. Client requests a file from server. The file received from server should be displayed on the client's terminal. Otherwise appropriate error message should be printed.

8. Design and implement C programs for both server and client to demonstrate inter-process communication using connectionless (UDP) sockets. Client requests a file

from server. The file received from server should be displayed on the client's terminal. Otherwise appropriate error message should be printed.

9. Design and implement a simple Linux driver.

10. Simulate three nodes point to point network with duplex links between them. Set the queue size, vary the bandwidth and find the number of packets dropped.

11. Simulate transmission of ping messages/trace route over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion.

SEM/YEAR	**: III SEM/2nd Year**
COURSE CODE	**: 20VCXXX**
TITLE OF THE COURSE	**: Microprocessor & Micro Controller Lab**
L: T/A: P: C	**: 0: 0: 5: 5**

List of experiments:

a) Programming experiments to implement software programs using stacks, and queues,

b) Programming experiments to implement software programs using linked lists

c) Programming experiments to implement software programs on bit operations

d) Programming experiments to implement software programs using arithmetic operations

e) Programming experiments to implement software programs - searching and sorting

f) Interface ADC to microprocessor kit

g) Interface DAC to microprocessor kit

h) Interface Logic Controller to microprocessor kit

i) Interface Stepper motor to microprocessor kit

i) Interface Additional Keyboard and display units to microprocessor kit

j) Interface 2 compatible devices

4th Semester

SEM/YEAR : IV SEM/2nd Year
COURSE CODE : 20VCXXX
TITLE OF THE COURSE : Software Engineering
L: T/A: P: C : 2: 0: 0: 2

Course Objectives

This course is introduced to give the students necessary knowledge, understanding and

Design aspects in Software Engineering

Course outcomes

At the end of the course students will be able to

1. Understand software development life cycle models, process models, and various design engineering techniques

2. Understand the importance of testing and us different types of testing techniques.

UNIT 1 **6hrs**

Introduction to Software Engineering: FAQ's about software engineering, Professional and ethical responsibility. Socio-Technical systems: Emergent system properties, The evolving role of software, Changing Nature of Software, Software myths. A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models. Organizations, people and computer systems, Legacy systems, Software Cost Estimation: Productivity; Estimation techniques

UNIT 2 **6hrs**

Process models: A simple safety- critical system; System dependability; Availability and Reliability, the waterfall model, Incremental process models, Evolutionary process Models, The Unified process, Comparison of different models with case studies

UNIT 3 **6hrs**

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document. Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

UNIT 4 **6hrs**

System models: Context Models, Behavioral models, Data models, Object models, structured Methods

UNIT 5 **6hrs**

Testing Strategies: Verification and Validation: Planning; Software inspections; Automated static analysis; Verification and formal methods. A strategic approach to software testing, System testing, the art of Debugging; Component testing; Test case design; Test automation - Selenium, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing.

Text Books

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition.

McGraw Hill International Edition.

Reference Books

1. Software Engineering- K.K. Agarwal &Yogesh Singh, New Age International Publishers

2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, JohnWiely.

3. SystemsAnalysisandDesign-ShelyCashmanRosenblatt,ThomsonPublications.

4. SoftwareEngineeringprinciplesandpractice-WamanSJawadekar,TheMcGraw- Hill Companies.

SEM/YEAR : **IV SEM/2nd Year**
COURSE CODE : **20VCXXX**
TITLE OF THE COURSE : **Java Programming**
L: T/A: P: C : **2: 0: 0: 2**

OBJECTIVES:

• Understanding the OOP's concepts, classes and objects, threads, files, applets, swings

And act.

• This course introduces computer programming using the JAVA programming language

With object-oriented programming principles

• Emphasis is placed on event-driven programming methods, including creating and

Manipulating objects, classes, and using Java for network level programming and middleware development

UNIT-I: **6hrs**

Introduction to OOP, procedural programming language and object oriented language, principles of OOP, applications of OOP, history of java, java features, JVM, program structure. Variables, primitive data types, identifiers, literals, operators, expressions, precedence rules and associativity, primitive type conversion and casting, flow of control.

UNIT-II: **6hrs**

Classes and objects, class declaration, creating objects, methods, constructors and constructor Overloading, garbage collector, importance of static keyword and examples, this keyword, arrays, Command line arguments, nested classes

UNIT-III: **6hrs**

Inheritance, types of inheritance, super keyword, final keyword, overriding and abstract class. Interfaces, creating the packages, using packages, importance of CLASSPATH and java.lang package Exception handling, importance of try, catch, throw, throws and finally block, user defined exceptions, Assertions.

UNIT-IV: **6hrs**

Multithreading: introduction, thread life cycle, creation of threads, thread priorities, thread synchronization, communication between threads. Reading data from files and writing data to files, random access file,

UNIT-V: **6hrs**

Applet class, Applet structure, Applet life cycle, sample Applet programs. Event handling: event delegation model, sources of event, Event Listeners, adapter classes, inner classes.

TEXT BOOKS:

1. The complete Reference Java, 8th edition, Herbert Schildt, TMH.

2. Programming in JAVA, Sachin Malhotra, SaurabhChoudary, Oxford.

3. Introduction to java programming, 7th edition by Y Daniel Liang, Pearson.

REFERENCE BOOKS:

1. Swing: Introduction, JFrame, JApplet, JPanel, Componets in Swings, Layout Managers in

2. Swings, JList and JScrollPane, Split Pane, JTabbedPane, JTree, JTable, Dialog Box

SEM/YEAR : **IV SEM/2nd Year**
COURSE CODE : **20VCXXX**
TITLE OF THE COURSE : **WSA & Linux Server Administration**
L: T/A: P: C : **2: 0: 0: 2**

Objectives:

1. Install, administer and maintain a Windows Server 2003 implementation;
2. Create user and group accounts in Windows 2003;
3. Install and configure Active Directory services;
4. Identify network protocols and services supported by Windows Server 2003; and
5. Implement a backup, recovery and disaster recovery plan.

Unit 1: **6hrs**

Installation of Windows Server, Windows Server file systems, NTFS Security

Unit2: **6hrs**

Installation and administration of Active Directory services, Create and administer user and group accounts, user and group policies

Unit 3: **6hrs**

Network protocols and services supported by Windows Server

Unit 4: **6hrs**

Enable and configure Routing and Remote Access Service, Backup and restoration of data. Implementation of a disaster recovery plan

Unit 5: **6hrs**

Monitoring and optimizing performance of a Windows Server implementation

Text Books:

1. Windows Server 2012: Pocket Consultant. Microsoft Press by Stanek, W., Microsoft Press ISBN-10: | ISBN-13: 978-0-735-66633-7
2. Windows Server 2016: Server Infrastructure. Stanek & Associates by Stanek, W., Stanek & Associates

SEM/YEAR : **IV SEM/2nd Year**
COURSE CODE : **20VCXXX**
TITLE OF THE COURSE : **IoT**
L: T/A: P: C : **2: 0: 0: 2**

COURSE OBJECTIVES:

1. To learn the building blocks of Internet of Things (IoTs) and their characteristics.

2. To introduces the students to the programming aspects of Internet of Things with

a view towards rapid prototyping of IoT applications.

3. To learn Reference architectures for different levels of IoT applications.

4. To learn IoT data analytics and Tools for IoT.

COURSE OUTCOMES:

At the end of the course students will be able to

1. Will be able to identify a suitable IOT data analytics and a tool for IOT

2. Will know in a manner how the general Internet as well as Internet of Things work

UNIT 1 - Introduction **6hrs**

Introduction: Concepts behind the Internet of Things. - The IoT paradigm - Smart objects - Bits and atoms - Goal orientation - Convergence of technologies. Introduction to Internet of Things Introduction, Definition & Characteristics of IoT ,Physical Design of IoT , Things in IoT , IoT Protocols . IoT Levels & Deployment Templates

UNIT 2 - Domain Specific IOTs: **6hrs**

Introduction, Home Automation, Cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, IoT and M2M- Introduction, M2M , Difference between IoT and M2M , SDN and NFV for IoT, Software Defined Networking , Network Function Virtualization

UNIT 3 - IOT SYSTEM MANAGEMENT WITH NETCONF **6hrs**

Need for IoT Systems Management, Simple Network Management Protocol (SNMP), Limitations of SNMP, Network Operator Requirements, NETCONF 83 4.5 YANG, IoT Systems Management with NETCONF-YAN , NETOPEER

UNIT 4 - DEVELOPING INTERNET OF THINGS **6hrs**

IoT Platforms Design Methodology , Introduction, IoT Design Methodology, Case Study on IoT System for Weather Monitoring, DATA ANALYTICS FOR IOT -Introduction , Apache Hadoop ,MapReduce Programming Model , Using Apache Storm for Real-time Data Analysis ,REST-based approach ,WebSocket-based approach , Structural Health Monitoring Case Study

UNIT 5 - Tools for IoT Introduction **6hrs**

Chef, Setting up Chef , Chef Case Studies, Multi-tier Application Deployment ,Hadoop Cluster , Storm Cluster, Puppet, Puppet Case Study - Multi-tier Deployment, NETCONF- YANG Case Studies ,Steps for IoT device Management with NETCONF-YANG , Managing Smart Irrigation IoT System with NETCONF-YANG , Managing Home Intrusion Detection IoT System with NETCONF-YANG , IoT Code Generator

Text books:

1. Arshdeep Bahga and Vijay Madisetti , Internet of Things - A Hands-On Approach, VPT; 1 edition (August 9, 2014)

Reference Books:

1. Ian G Smith, The Internet of Things 2012 New Horizons, IERC - Internet of Things European Research Cluster, 2012.

2. IEEE 802.3 Working Group, http://www.ieee802.org/3, Retrieved 2014. Paul Deitel, C How to Program, 7th Edition, Deitel How to Series.

3. M. Wang, G. Zhang, C. Zhang, J. Zhang, C. Li, An IoT-based Appliance Control System for Smart Homes, ICICIP 2013.

4.] H. Zhang, J. Guo, X. Xie, R. Bie, Y, Sun, Environmental Effect Removal Based Structural Health Monitoring in the Internet of Things, International Conference on Innovative Mobile and Internet Services in Ubiquitous Computing (IMIS), 2013

SEM/YEAR : **IV SEM/2nd Year**
COURSE CODE : **20VCXXX**
TITLE OF THE COURSE : **Web Programming**
L: T/A: P: C : **2: 0: 0: 2**

OBJECTIVES:

• This course is designed to introduce students with no programming experience to the programming languages and techniques associated with the World Wide Web. The course will introduce web-based media-rich programming tools for creating interactive web pages.

UNIT-I: HTML, CSS **6hrs**

Basic Syntax, Standard HTML Document Structure, Basic Text Markup, Images, Hypertext

Links, Lists, Tables, Forms, HTML5 CSS: Levels of Style Sheets, Style Specification Formats, Selector Forms, The Box Model, Conflict Resolution

UNIT-II: **6hrs**

Java script: The Basic of Java script: Objects, Primitives Operations and Expressions, Screen Output and Keyboard Input, Control Statements, Object Creation and Modification, Arrays, Functions, Constructors, Pattern Matching using Regular Expressions DHTML: Positioning Moving and Changing Elements

UNIT-III: **6hrs**

XML: Document type Definition, XML schemas, Document object model, XSLT, DOM and SAX Approaches, AJAX A New Approach: Introduction to AJAX, Integrating PHP and AJAX.

UNIT-IV: **6hrs**

PHP Programming: Introducing PHP: Creating PHP script, Running PHP script. Working with variables and constants: Using variables, Using constants, Data types, Operators, Controlling program flow, Conditional statements, Control statements, Arrays, functions, working with forms and Databases such as MySQL.

UNIT-V: **6hrs**

Introduction to PERL, Operators and if statements, Program design and control structures, Arrays, Hashs and File handling, Regular expressions, Subroutines, Retrieving documents from the web with Perl. Introduction to Ruby

TEXT BOOKS:

1. Programming the World Wide Web, Robet W Sebesta, 7ed, Pearson.

2. Web Technologies, Uttam K Roy, Oxford

3. The Web Warrior Guide to Web Programming, Bai, Ekedahl, Farrelll, Gosselin, Zak,

Karparhi, Maclntyre, Morrissey, Cengage

REFERENCE BOOKS:

1. Ruby on Rails Up and Running, Lightning fast Web development, Bruce Tate, Curt Hibbs, Oreilly (2006)

2. Programming Perl, 4ed, Tom Christiansen, Jonathan Orwant, Oreilly (2012)

3. Web Technologies, HTML< JavaScript, PHP, Java, JSP, XML and AJAX, Black book, Dream Tech.

4. An Introduction to Web Design, Programming, Paul S Wang, Sanda S Katila, Cengage Learning

SEM/YEAR : **IV SEM/2nd Year**
COURSE CODE : **20VCXXX**
TITLE OF THE COURSE : **Design and Analysis of Algorithms**
L: T/A: P: C : **2: 0: 0: 2**

OBJECTIVES:

Upon completion of this course, students will be able to do the following:

- Analyze the asymptotic performance of algorithms.
- Write rigorous correctness proofs for algorithms.
- Demonstrate a familiarity with major algorithms and data structures.
- Apply important algorithmic design paradigms and methods of analysis.
- Synthesize efficient algorithms in common engineering design situations

UNIT-I: **6hrs**

Introduction: What is an Algorithm, Algorithm Specification, Pseudocode conventions Recursive Algorithm, Performance Analysis, Space Complexity, Time Complexity, Amortized Complexity, Amortized Complexity, Asymptotic Notation, Practical Complexities, Performance measurement?

UNIT-II: **6hrs**

Dived and Conquer: General Method, Defective Chessboard, Binary Search, Finding the Maximum and Minimum, Merge Sort, Quick Sort, Performance Measurement, Randomized Sorting Algorithms.

UNIT-III: **6hrs**

The Greedy Method: The General Method, Knapsack Problem, Job Sequencing with Deadlines, Minimum-cost Spanning Trees, Prim's Algorithm, Kruskal's Algorithms, An Optimal Randomized Algorithm, Optimal Merge Patterns, Single Source Shortest Paths.

UNIT-IV: **6hrs**

Dynamic Programming: All - Pairs Shortest Paths, Single – Source Shortest paths General Weights, String Edition, 0/1 Knapsack, Reliability Design,

UNIT-V: **6hrs**

Backtracking: The General Method, The 8-Queens Problem, Sum of Subsets, Graph Coloring , Hamiltonian Cycles

TEXT BOOKS:

1. Fundamentals of computer algorithms E. Horowitz S. Sahni, University Press

2. Introduction to AlgorithmsThomas H. Cormen, PHI Learning

REFERENCE BOOKS

1. The Design and Analysis of Computer Algorithms, Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman

2. Algorithm Design, Jon Kleinberg, Pearson.

SEM/YEAR : **IV SEM/2nd Year**
COURSE CODE : **20VCXXX**
TITLE OF THE COURSE : **Web Programming Lab**
L: T/A: P: C : **0: 0: 5: 5**

List of Experiments:

1. Design the static web pages required for an online book store web site.
   a) HOME PAGE: The static home page must contain three frames. Top frame: Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below). Left frame: At least four links for navigation, which will display the catalogue of respective links. For e.g.: When you click the link "MCA" the catalogue for MCABooks should be displayed in the Right frame. Right frame: The pages to the links in the left frame must be loaded here. Initially this page contains description of the web site.
   b) login page
   c) CATOLOGUE PAGE: The catalogue page should contain the details of all the books available in the web site in a table. The details should contain the following: 1. Snap shot of Cover Page. 2. Author Name. 3. Publisher. 4. Price. 5. Add to cart button.
   d) REGISTRATION PAGE: Create a "registration form "with the following fields 1) Name (Text field) 2) Password (password field) 3) E-mail id (text field) 4) Phone number (text field) 5) Sex (radio button) 6) Date of birth (3 select boxes) 7) Languages known (check boxes – English, Telugu, Hindi, Tamil) 8) Address (text area
   e) Design a web page using CSS (Cascading Style Sheets) which includes the following: 1) Use different font, styles: In the style definition you define how each selector should work (font, color etc.). Then, in the body of your pages, you refer to these selectors to activate the styles

SEM/YEAR	**: IV SEM/2nd Year**
COURSE CODE	**: 20VCXXX**
TITLE OF THE COURSE	**: WSA & Linux Server Administration Lab**
L: T/A: P: C	**: 0: 0: 4: 4**

List of Experiments:

1. Deploying and configuring Windows Server
   a) Deploying and configuring Server Core
   b) Implementing and using remote server administration

2. Implementing identity services and Group Policy
   a) Deploying a new domain controller on Server Core
   b) Configuring Group Policy
   c) Deploying and using certificate services
3. Implementing and configuring network infrastructure services in Windows Server
   a) Deploying and configuring DHCP
   b) Deploying and configuring DNS
4. Implementing storage solutions in Windows Server
5. Implementing and configuring virtualization in Windows Server

SEM/YEAR	**: IV SEM/2nd Year**
COURSE CODE	**: 20VCXXX**
TITLE OF THE COURSE	**: Java Programming Lab**
L: T/A: P: C	**: 0: 0: 5: 5**

List of Programs

1. Write a program to display your Information on the Console.
2. WAP to use the Conditional Statements.
3. WAP to use the Control Statements.
4. WAP to pass Command Line Arguments & display the same on the console.
5. WAP to declare a String Array of with varying Width & display the content of the Array in the same manner in which the data is stored.
6. WAP to demonstrate the use of Operators.
7. WAP to demonstrate Pass By Value & passing the Objects as Parameters.
8. WAP to demonstrate Method Overloading & Method Overriding.
9. WAP to demonstrate Constructor Overloading.
10. WAP to use Abstract Classes.
11. Create a Package & Import the same in the other class.
12. Demonstrate the use of Access Modifiers with the help of Packages.
13. WAP to demonstrate Multiple Inheritance with the help of Interfaces.
14. WAP to handle the Exceptions.
15. WAP to use 'finally' & the Nested 'try' block.
16. Demonstrate the use of 'try', 'catch', 'finally', 'throw' & 'throws' in Exception handling.
17. Create your own Exception class & throw the same in the other class.
18. WAP to demonstrate the Life Cycle of Thread.
19. WAP to Create Multiple Threads & set the Priorities.
20. WAP to demonstrate Thread Synchronization.
21. WAP to take the Input from the User using Basic IO & display the output.
22. WAP to demonstrate the use of static Methods & static Blocks.
23. Demonstrate the use of transient in Serialization.
24. Usage of String & String Buffer.
25. WAP to create a Process & display the output given by that Process.26. WAP to set the System Properties.

27. WAP to use Array List, Sort the Elements, retrieve the values & the Keys from the Map.

28. Programs to work with Collection Interfaces & Classes.

29. WAP to retrieve all the File Properties & display the same.

30. WAP to demonstrate the various Input & Output Streams (Character Streams, Byte Streams, Object Streams).

31. WAP for Serializing the Objects & to Deserialize the same.

32. WAP to display your information on to the Applet Window.

33. WAP to pass your information to the Applet & display the same on to the Applet Window (Using param tag).

34. Demonstrate various Methods of Graphics class.

35. Create a GUI Form (Applet) using all the possible awt Controls.

36. Create a GUI Application form using all the possible awt Controls.

37. Create a Notepad with all the functionalities.

38. WAP to demonstrate various Events in Java.

39. WAP using Anonymous classes & Adapter classes.

40. WAP to Communicate from one System to other, using Networking (TCP/IP).

41. WAP to Communicate from one System to other, using Networking (UDP).

42. WAP to call the Method from a Remote System using RMI.

Reference books:

1. The complete reference Java 2 - Patrick Naughton

2. Pure Java 2 -Techmedia

3. Java 2 - Sun Microsystems

4. Java 2 - O'Reilly

5. Java Programming - Balaguruswamy

SEM/YEAR	**: IV SEM/2nd Year**
COURSE CODE	**: 20VCXXX**
TITLE OF THE COURSE	**: IOT Lab**
L: T/A: P: C	**: 2: 0: 0: 2**

List of Experiments:

1. Introduction to Arduino platform and programming
2. Interfacing Arduino to Zigbee module
3. Interfacing Arduino to GSM module
4. Interfacing Arduino to Bluetooth Module
5. Introduction to Raspberry PI platform and python programming
6. Interfacing sensors to Raspberry PI
7. Communicate between Arduino and Raspberry PI using any wireless medium
8. Setup a cloud platform to log the data
9. Log Data using Raspberry PI and upload to the cloud platform
10. Design an IOT based system