



DEPARTMENT OF COMPUTER SCIENCE (Shift – I)

PROGRAMME OUTCOME

- PO1:** Develop programs in various computer science technologies.
- PO2:** Acquire the knowledge of working principles of computers.
- PO3:** Improve analytical and critical thinking.
- PO4:** Analyze a problem and identify the requirements for solution.

PROGRAMME SPECIFIC OUTCOME

- PSO1:** Identify the software and hardware aspects of computer systems.
- PSO2:** Solve mathematical and statistical problems.
- PSO3:** Define the various stages of software system.
- PSO4:** Acquire in depth knowledge of computer technologies.
- PSO5:** Analyze the various applications of computer science.

SYLLABUS

Subject Name: Problem Solving Using Python

Subject Code: SE21A

Year: I

Semester: I

UNIT 1: Introduction: The essence of computational problem solving – Limits of computational problem solving-Computer algorithms-Computer Hardware-Computer Software-The process of computational problem solving-Python programming language - Literals - Variables and Identifiers - Operators - Expressions and Data types.

UNIT 2: Control Structures: Boolean Expressions - Selection Control - If Statement- Indentation in Python - Multi-Way Selection -- Iterative Control- While Statement- Infinite loops- Definite vs. Indefinite Loops- Boolean Flags and Indefinite Loops. Lists: List Structures - Lists in Python - Iterating over lists in Python.

UNIT 3: Functions: Program Routines- Defining Functions- More on Functions: Calling Value-Returning Functions- Calling Non-Value-Returning Functions- Parameter Passing - Keyword Arguments in Python - Default Arguments in Python-Variable Scope.

UNIT 4 : Objects and their use: Software Objects - Turtle Graphics – Turtle attributes-Modular Design: Modules - Top-Down Design - Python Modules - Text Files: Opening, reading and writing text files - String Processing - Exception Handling.

UNIT 5: Dictionaries and Sets: Dictionary type in Python - Set Data type. Object Oriented Programming using Python: Encapsulation - Inheritance – Polymorphism. Recursion: Recursive Functions.

TEXT BOOK:

1. Charles Dierbach, —Introduction to Computer Science using Python - A computational Problem solving Focusl, Wiley India Edition, 2015.

REFERENCE BOOKS:

1. Mark Lutz, *–Learning Python Powerful Object Oriented Programmingl*, O’reilly Media 2018, 5th Edition.
2. Timothy A. Budd, *–Exploring Pythonl*, Tata McGraw Hill Education Private Limited 2011, 1st Edition.
3. Allen Downey, Jeffrey Elkner, Chris Meyers, *–How to think like a computer scientist: learning with Pythonl*, 2012.
4. Sheetal Taneja & Naveen kumar, *–Python Programming a Modular approach – A Modular approach with Graphics, Database, Mobile and Web applicationsl*, Pearson, 2017.
5. Ch Satyanarayana M Radhika Mani, B N Jagadesh, *–Python programmingl*, Universities Press 2018.

WEB REFERENCES

- <http://interactivepython.org/courselib/static/pythonds>
- <http://www.ibiblio.org/g2swap/byteofpython/read/>
- <http://www.diveintopython3.net/>
- <http://greenteapress.com/wp/think-python-2e/>
- NPTEL & MOOC courses titled Python programming

- http://spoken-tutorial.org/tutorial-search/?search_foss=Python&search_language=English
- <http://docs.python.org/3/tutorial/index.html>

COURSE OUTCOME:

- CO1:** Describe the core syntax and semantics of Python programming language.
- CO2:** Interpret the fundamental Python syntax and the use of Python control flow statements
- CO3:** Explain the need for working with functions in Python.
- CO4:** Develop simple turtle graphics programs in Python.
- CO5:** Explain the usage of Dictionaries, Sets and Object-Oriented programming concepts in Python.

LIST OF EXERCISES:

1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by user. Assign grades according to the following criteria:
Grade A: Percentage ≥ 80 Grade B: Percentage ≥ 70 and < 80
Grade C: Percentage ≥ 60 and < 70 Grade D: Percentage ≥ 40 and < 60
Grade E: Percentage < 40
3. Program, to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. Program to display the first n terms of Fibonacci series.
5. Program to find factorial of the given number using recursive function.
6. Write a Python program to count the number of even and odd numbers from array of N numbers.
7. Python function that accepts a string and calculate the number of upper case letters and lower case letters.
8. Python program to reverse a given string and check whether the give string is palindrome or not.
9. Write a program to find sum of all items in a dictionary.
10. Write a Python program to construct the following pattern, using a nested loop
1
22
333
4444
55555
666666
7777777
88888888
999999999
11. Read a file content and copy only the contents at odd lines into a new file.
12. Create a Turtle graphics window with specific size.
13. Write a Python program for Towers of Hanoi using recursion
14. Create a menu driven Python program with a dictionary for words and their meanings.
15. Devise a Python program to implement the Hangman Game.

COURSE OUTCOME:

- CO1:** Develop simple programs using input statements of Python programming language.
CO2: Implement various control structures of Python in simple programs.
CO3: Manipulate files using Python statements.
CO4: Develop simple turtle graphics window and towers of Hanoi using recursion in Python.
CO5: Implement menu driven Python programs and game programs like Hangman.

Subject Name: Allied Mathematics I
Subject Code: SM3AA

Year: I
Semester: I

UNIT 1: Algebra And Numerical Methods:

Algebra: Summation of series - simple problems.

Numerical Methods: Operators E, Δ, ∇ , difference tables- Newton-Raphson method- Newton's forward and backward interpolation formulae for equal intervals, Lagrange's interpolation formula. Chapter 2, Section 2.1.3, 2.2, 2.2.1, 2.3, 2.3.3 Chapter 3, Section 3.4.1 and Chapter 5, Section 5.1 and 5.2.

UNIT 2 : Matrices: Symmetric, Skew-Symmetric, Orthogonal, Hermetian, Skew-Hermetian and Unitary matrices. Eigen values and Eigen-vectors, Cayley-Hamilton theorem (without proof) – verification- Computation of inverse of matrix using Cayley - Hamilton theorem.

Chapter 4, Section 4.1.1 to 4.1.6, 4.5, 4.5.2, 4.5.3.

UNIT 3 : Theory Of Equations: Polynomial equations with real coefficients, irrational roots, complex roots, symmetric functions of roots, transformation of equation by increasing or decreasing roots by a constant, reciprocal equation-simple problems. Chapter 3, Section 3.1 to 3.4.1(omit section 3.2.1)

UNIT 4 : Trigonometry: Expansions of $\sin(n\theta)$ and $\cos(n\theta)$ in a series of powers of $\sin\theta$ and $\cos\theta$ - Expansions of $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ in a series of sines, cosines and tangents of multiples of $-\theta$ - Expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in a series of powers of $-\theta$ - Hyperbolic and inverse hyperbolic functions .

Chapter 6, Section 6.1 to 6.3.

UNIT 5 : Differential Calculus: Successive differentiation, nth derivatives, Leibnitz theorem (without proof) and applications, Jacobians, Curvature and radius of curvature in Cartesian co-ordinates, maxima and minima of functions of two variables- Simple problems

Chapter 1, Section 1.1 to 1.3.1 and 1.4.3.

Content and treatment as in

Allied Mathematics, Volume I and II, by P. Duraipandian and S. Udayabaskaran, S. Chand Publications

Reference:-

1. S. Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.
2. Allied Mathematics by Dr. A. Singaravelu, Meenakshi Agency.

e-Resources:

1. <http://www.themathpage.com>
2. <http://nptel.ac.in>

COURSE OUTCOME:

CO1: Evaluate the summation of series, Operators, Newton-Raphson Method, Newton's forward and backward formulae, Lagrange's Formula.

CO2: Calculate symmetric, Skew-Symmetric, Hermetian, Eigen Values and Vectors, Cayley – Hamilton theorem.

CO3: Determine Polynomial Equations, irrational and complex roots, transformation of equation, Reciprocal equation.

CO4: Explain the concepts of expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in a series of powers of $-\theta$ Hyperbolic and inverse hyperbolic function.

CO5: Understand the concepts of Successive differentiation, Leibnitz theorem, Jacobians, curvature, radius of curvature and maxima and minima of functions.

Subject Name: Basics Of Retail Marketing
Subject Code: CC5AD

Year: I
Semester: I

Unit 1: Retailing – definition – Retail Marketing – Growth of organized retailing in India – importance of retailing.

Unit 2: Functions of retailing – characteristics of Retailing – Types of Retailing – store retailing – Non-store retailing.

Unit 3: Retail location factors – Branding in Retailing – private labeling – Franchising concept.

Unit 4: Communication tools used in Retailing – Sales promotion, e-tailing – window display

Unit5: Supply chain management – definition – importance – Role of information Technology in retailing.

Reference Books:

1. Modern Retail management – J.N.Jain and P.P. Singh Regal publications New Delhi.
2. Retail Management- SujaNair, Himalaya Publishing House.

COURSE OUTCOME:

CO1: Learn the importance of Retail Marketing

CO2: Discuss the types of Retailing.

CO3: Describe Branding in Retailing.

CO4: Understand the Communication Tools used in Retailing.

CO5: Explain the Role of Information Technology in Retailing.

Subject Name: Computer Organization
Subject Code: SE22A

Year: I
Semester: II

UNIT 1: Data representation: Data types – Complements- fixed point and floating point representation other binary codes. Register Transfer and Microoperations: Register transfer language- Register transfer- Bus and Memory transfers – Arithmetic, logic and shift micro operations.

UNIT 2: Central processing unit: General register and stack organizations- instruction formats - Addressing modes- Data transfer and manipulation - program control- RISC - Pipelining - Arithmetic and instruction- RISC pipeline - Vector processing and Array processors.

UNIT 3: Microprocessor Architecture and its Operations - 8085 MPU - 8085 Instruction Set and Classifications. Programming in 8085: Code conversion - BCD to Binary and Binary to BCD conversions - ASCII to BCD and BCD to ASCII conversions - Binary to ASCII and ASCII to Binary conversions.

UNIT 4: Programming in 8085:BCD Arithmetic - BCD addition and Subtraction - Multibyte Addition and Subtraction - Multiplication and Division. Interrupts: The 8085 Interrupt – 8085 Vectored Interrupts –

UNIT 5: Direct Memory Access(DMA)and 8257 DMA controller - 8255A Programmable Peripheral Interface. Basic features of Advanced Microprocessors - Pentium - I3 , I5 and I7

COURSE OUTCOME:

CO1: Describe the major components of a computer system and state their function and purpose.

CO2: Describe the microstructure of a processor.

CO3: Demonstrate the ability to program a microprocessor in assembly language.

CO4: Describe about Interrupt concepts.

CO5: Classify and describe the operation DMA and peripheral Interfaces.

Subject Name: Computer Organization Lab
Subject code: SE221

Year: I
Semester: II

LIST OF EXERCISES:

I : Addition and Subtraction

1. 8 - bit addition
2. 16 - bit addition
3. 8 - bit subtraction
4. BCD subtraction

II : Multiplication and Division

1. 8 - bit multiplication
2. BCD multiplication
3. 8 - bit division

III: Sorting and Searching

1. Searching for an element in an array.
2. Sorting in ascending order.
3. Finding largest and smallest elements from an array
4. Reversing array elements
5. Block move
6. Sorting in descending order

IV: Code Conversion

1. BCD to Hex and Hex to BCD
2. Binary to ASCII and ASCII to binary
3. ASCII to BCD and BCD to ASCII

V: Applications

1. Square of a single byte Hex number
2. Square of a two digit BCD number
3. Square root of a single byte Hex number
4. Square root of a two digit BCD number

COURSE OUTCOME:

CO1: Implement the arithmetic operations in assembly language programming.

CO2: Understand the programming logic of 8085 in various aspects.

CO3: Implement Sorting and Searching technique.

CO4: Convert ASCII, BCD, HEX codes.

CO5: Design and implement Square and square root of HEX and BCD number.

UNIT 1 : Integral Calculus: Bernoulli's formula – Reduction formulae $\int x^m (ax+b)^n dx$, $\int x^m e^{ax+b} dx$, $\int x^m \sin(ax+b) dx$, $\int x^m \cos(ax+b) dx$ (m, n being positive integers), Fourier series for functions in $(0, 2\pi)$, $(-\pi, \pi)$.
Chapter 2: Section 2.7 & 2.9, Chapter 4: Section 4.1.

UNIT 2 : Differential Equations: Ordinary Differential Equations: second order non-homogeneous differential equations with constant coefficients of the form $ay'' + by' + cy = X$ where X is of the form e^{ax} , $\cos bx$ and $e^{ax} \sin bx$ -Related problems only.
Partial Differential Equations: Formation, complete integrals and general integrals, four standard types and solving Lagrange's linear equation $Pp + Qq = R$.
Chapter 5: Section 5.2.1, Chapter 6: Section 6.1 to 6.4

UNIT 3 : Laplace Transforms: Laplace transformations of standard functions and simple properties, inverse Laplace transforms, Application to solution of linear differential equations up to second order-simple problems.
Chapter 7: Section 7.1.1 to 7.1.4 & 7.2 to 7.3

UNIT 4 : Vector Differentiation: Introduction, Scalar point functions, Vector point functions, Vector differential operator Gradient, Divergence, Curl, Solenoidal, irrotational, identities.
Chapter 8, Section 8.1 to 8.4.4

UNIT 5 : Vector Integration: Line, surface and volume integrals, Gauss, Stoke's and Green's theorems (without proofs). Simple problems on these.
Chapter 8, Section 8.5 to 8.6.3.

Content and treatment as in

Allied Mathematics, Volume I and II, P. Duraipandian and S. Udayabaskaran, S. Chand Publications.

Reference:-

1. S. Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.
2. Allied Mathematics by Dr. A. Singaravelu, Meenakshi Agency.

e-Resources:

1. <http://www.sosmath.com>
2. http://www.analyzemath.com/Differential_Equations/applications.html

COURSE OUTCOME

- CO1:** Describe the concepts of Bernoulli's Formula, Reduction Formula, Fourier series.
- CO2:** Determine the Second order non-homogeneous differential equations, P.D.E formation and four standard types, Lagrange's linear equation.
- CO3:** Evaluate Laplace transformation, Inverse Laplace transforms, Application to solution of linear differential equations up to second order.
- CO4:** Calculate Scalar and Vector point functions, Gradient, Divergence, Curl, Solenoidal.
- CO5:** Explain the concepts of Surface and Volume integrals, Gauss, Stoke's and Green's Theorems and Problems.

Subject Name: Basics Of Business Insurance
Subject Code: CC5AB

Year: I
Semester: II

Unit 1: Introduction to Insurance - Type of Insurance - Principles of Insurance.

Unit 2: Salient features of IRDA Act - Administration of IRDA Act- Regulatory measures of IRDA

Unit 3: Life Insurance products — Term, Whole life, Endowment.

Unit 4: Introduction to general Insurance - fire, marine and motor insurance

Unit 5: Government and Insurance companies - LIC India- private players in insurance in India.

Book for Reference:

- i. Dr.N.Premavathy— Elements of Insurance Sri Vishnu Publications, Chennai.
- ii. Dr.A.Muthy — Elements of Insurance, Margham Publications, Chennai.
- iii. M.N.Mishra — Insurance, Principles and practice, S.Chand& Co. Ltd., New Delhi

References

- i. NaliniPravaTripathy, PrabirPaal — Insurance Theory & Practice. Prentice Hall of India.
- ii. AnandGanguly — Insurance Management, New Age International Publishers.

COURSE OUTCOME:

- CO1:** Discuss the Types of Insurance and Principles of Insurance.
- CO2:** Understand Administration of IRDA Act.
- CO3:** Describe Life Insurance Products.
- CO4:** Learn the introduction of General Insurance.
- CO5:** Learn the Government and Insurance Companies.

Sub Name: JAVA AND DATA STRUCTURES

Year:II

Sub Code: SE23A

Semester:III

UNIT – I: History and Evolution of Java - Features of Java - Object Oriented Concepts – Byte code - Lexical Issues - Data Types – Variables- Type Conversion and Casting- Operators - Arithmetic Operators - Bitwise - Relational Operators - Assignment Operator - The conditional Operator - Operator Precedence- Control Statements – Arrays.

UNIT – II: Classes - Objects - Constructors - Overloading method - Static and fixed methods - Inner Classes - String Class- Overriding methods - Using super-Abstract class - this keyword – finalize() method – Garbage Collection.

UNIT – III: Packages - Access Protection - Importing Packages - Interfaces - Exception Handling - Throw and Throws-The Java Thread Model- Creating a Thread and Multiple Threads - Thread Priorities Synchronization-Inter thread Communication - Deadlock - Suspending, Resuming and stopping threads – Multithreading-I/O Streams - File Streams - Applets .

UNIT – IV: Abstract Data Types(ADTs)-List ADT-Array based implementation-linked list implementation-singly linked list-doubly linked list-circular linked list-Stack ADT operations-Applications-Evaluating arithmetic expressions-Conversion of infix to postfix expression-Queue ADT-operations-Applications of Queues.

UNIT – V: Trees-Binary Trees- representation - Operations on Binary Trees- Traversal of a Binary Tree -Binary Search Trees, Graphs-Representation of Graphs - Traversal in Graph -Dijkstra's Algorithm, Depth-First vs Breadth-First Search.

TEXT BOOKS:

1. E.Balagurusamy,| *Programming with Java: A Primer* |, Tata McGraw Hill 2014, 5th Edition.
2. Mark Allen Weiss, -*Data Structures and Algorithms Analysis in C++* |, Person Education 2014, 4th Edition.

REFERENCES:

1. Herbert Schildt, -*JAVA 2: The Complete Referencel*, McGraw Hill 2018, 11th Edition.
2. Aho, Hopcroft and Ullman, -*Data Structures and Algorithms –*, Pearson Education 2003.
3. S. Sahni, -*Data Structures, Algorithms and Applications in JAVA* |, Universities Press 2005

WEB REFERENCES:

- NPTEL & MOOC courses titled Java and Data Structures
- <https://nptel.ac.in/courses/106106127/>
- <https://nptel.ac.in/courses/106105191/>

COURSE OUTCOME:

CO1: Ability to identify object oriented concepts.

CO2: Identify Java code in constructors, methods and classes.

CO3: Apply the concepts of packages, Multithreading and Exception handling to develop efficient and error free codes.

CO4: Ability to describe Stack, queue, linked list operation.

CO5: Choose the appropriate data structure for solving a given problem.

Subject Name:Data Structures using Java Lab

Year:II

Subject Code: SE231

Semester:III

LIST OF EXERCISES:

1. Write a Java program to implement the Stack ADT using a singly linked list.
2. Write a Java program to implement the Queue ADT using a singly linked list.
3. Write a Java program for the implementation of circular Queue.
4. Write a Java program that reads an infix expression, converts into postfix form
5. Write a Java program to evaluate the postfix expression (use stack ADT).
6. Write a Java program to an Insert an element into a binary search tree.
7. Write a Java program to delete an element from a binary search tree.
8. Write a Java program to search for a key element in a binary search tree.
9. Write a Java program for the implementation of BFS for a given graph.
10. Write a Java program for the implementation of DFS for a given graph.

COURSE OUTCOME:

CO1: Write functions to implement linear and non-linear data structure operations.

CO2: Suggest appropriate linear and non-linear data structure operations for solving a given problem.

CO3: Develop program to evaluate expression using infix and postfix operations.

CO4: Ability to implement binary search tree.

CO5: Execute programs for BFS and DFS using Graph.

Subject Name: ALLIED STATISTICS -I
Subject Code: SP3AA

Year: II
Semester: III

UNIT – I: Methods of collection: Complete enumeration – Sample Survey – Primary data – Secondary data sources – Types of variables. Nominal, ordinal and scale data. Presentation of Data: Presentation of data by tables – construction of tables (Univariate and Bivariate) – frequency table and contingency table

UNIT – II: Diagrammatic presentation: Line diagram, Bar diagrams: Simple, multiple, subdivided and Percentage – Pie chart, comparative pie chart – Graphical representation of a frequency distribution by histogram and frequency polygon and Ogives

UNIT – III: Analysis of Data (Univariate): Measures of central tendency. Arithmetic mean. Median and Mode choice of an average – characteristic of good average.

UNIT – IV: Measures of dispersion: Range - Quartile deviation-mean deviation – standard deviation- relative measures of dispersion – Coefficient of Variance

UNIT – V: Analysis of Data (Bivariate): Correlation. Scatter plot – coefficient of correlation. Pearson's Correlation Coefficient, Spearman's rank correlation coefficient – correlation coefficient for bivariate frequency table. Association of attributes: Chi-square test of independence of attributes

BOOKS FOR STUDY AND REFERENCES:

1. Gupta, S.C and Kapoor, V.K (2002), Fundamentals of Mathematical Statistics, Sultan Chand and Sons, New Delhi.
2. Goon A.M., Gupta M.K. and Dasgupta B. (2002): Fundamentals of Statistics, Vol. I & II, 8th Edn. The World Press, Kolkata.
3. Irwin Miller, Marylees Miller (2006): John E. Freund's Mathematical Statistics with Applications, (7th Edn.), Prentice Hall International INC.
4. Mood, A.M. Graybill, F.A. and Boes, D.C. (2007): Introduction to the Theory of Statistics, 3rd Edn., (Reprint), Tata McGraw – Hill Pub. Co. Ltd.
5. Saxena H.C.: Elementary Statistics. S. Chand & Co., 2009.

COURSE OUT COME:

CO1: Understand the concepts of Types of Data, Variables and Presentation, Construction Of data by tables and their types.

CO2: Explain the Diagrammatic presentation data and Graphical representation of frequency distribution.

CO3: Evaluate the Measures of central tendency and Characteristic of good average.

CO4: Calculate the Measures of dispersion and Coefficient of Variance.

CO5: Compute Bivariate frequency table, coefficient of correlation and Chi – Square.

Subject Name: Web Technology
Subject Code: SE24A

Year:II
Semester:IV

UNIT - I: Introducing PHP – Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables Data types – Using Constants – Manipulating Variables with Operators.

UNIT – II: Controlling Program Flow: Writing Simple Conditional Statements - Writing More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions.

UNIT – III: Working with Arrays: Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms - Working with Array Functions – Working with Dates and Times.

UNIT – IV: Using Functions and Classes: Creating User-Defined Functions - Creating Classes – Using Advanced OOP Concepts. Working with Files and Directories: Reading Files-Writing Files Processing Directories.

UNIT – V: Working with Database and SQL: Introducing Database and SQL- Using MySQL- Adding and modifying Data-Handling Errors – Using SQLite Extension and PDO Extension. Introduction XML - Simple XML and DOM Extension.

TEXT BOOK:

1. VikramVaswani, —PHP A Beginner's Guidel, Tata McGraw Hill 2008.

REFERENCE BOOKS:

1. Steven Holzner , -The PHP Complete Referencel, Tata McGraw Hill, 2007.
2. Steven Holzer , —Spring into PHPl, Tata McGraw Hill 2011, 5thEdition.

WEB REFERENCES:

- <https://www.w3schools.com/php/>
- <https://www.phptpoint.com/php-tutorial-pdf/>
- <http://www.xmlsoftware.com/>

COURSE OUTCOME:

CO1: Understand the general concepts of PHP scripting language for the development of Internet websites.

CO2: Ability to describe the different types of conditional statements.

CO3: Ability to describe about Arrays.

CO4: Describe functions and classes using advanced OOP concept.

CO5: Understand the basic functions of MySQL database program and XML concepts

LIST OF PRACTICALS

1. Write a PHP program which adds up columns and rows of given table
2. Write a PHP program to compute the sum of first n given prime numbers
3. Write a PHP program to find valid an email address
4. Write a PHP program to convert a number written in words to digit.
5. Write a PHP script to delay the program execution for the given number of seconds.
6. Write a PHP script, which changes the color of the first character of a word
7. Write a PHP program to find multiplication table of a number.
8. Write a PHP program to calculate Factorial of a number.
9. Write a PHP script to read a file, reverse its contents, and write the result back to a new file
10. Write a PHP script to look through the current directory and rename all the files with extension .txt to extension .xtx.
11. Write a PHP script to read the current directory and return a file list sorted by last modification time. (using file time())
12. Write a PHP code to create a student mark sheet table. Insert, delete and modify records.
13. From a XML document (email.xml), write a program to retrieve and print all the e-mail addresses from the document using XML
14. From a XML document (tree.xml), suggest three different ways to retrieve the text value 'John' using the DOM:
15. Write a program that connects to a MySQL database and retrieves the contents of any one of its tables as an XML file. Use the DOM.

COURSE OUTCOME:

- CO1:** Ability to gain knowledge and develop application programs using PHP
CO2: Create dynamic Web applications such as content management, user registration, and ecommerce using PHP and to understand the ability to post and publish a PHP website.
CO3: Develop a MySQL database and establish connectivity using MySQL.
CO4: Design a web page using XML.
CO5: Usage of DOM in XML document.

Subject Name: ALLIED STATISTICS -II
Subject Code:SP3AB

Year: II
Semester:IV

UNIT- I: Basic concepts of Probability: Random Experiments, Sample space, Trial, Events, - Classical and empirical approach to probability and their limitations –Types of events: Exhaustive, mutually exclusive, equally likely and independent events – Axiomatic approach to probability - Basic theorems on probability using axiomatic approach. Bayes Theorem (statement only)

UNIT- II: Discrete probability mass function, cumulative distribution function- Theory and problems based on it. Bernoulli distribution, Binomial Distribution and Poisson Distribution.

UNIT- III: Continuous probability density function, cumulative distribution function - Theory and problems based on it. Normal Distribution and its properties, Standard Normal distribution, Problems based on it. Exponential Distribution.

UNIT- IV: Estimating parameters of discrete and continuous distributions, Introduction of Sampling distributions- student's t and chi-square distributions, distribution of sample mean from normal distribution. Density function and Properties only.

UNIT- IV: Testing of Hypothesis, Single mean test and double means test based on normal distribution and students t-distribution. Proportion test, Chi-square test, ANOVA test.

Books for Study:

1. Gupta, S. C and Kapoor, V. K (2002), Fundamentals of Mathematical Statistics, Sultan Chand and Sons, New Delhi.
2. Saxena H.C.: Elementary Statistics. S. Chand & Co., 2009.

COURSE OUT COME:

CO1: Understand the concepts of Probability and their limitations, uses of Baye theorem.

CO2: Compute Binomial Distribution and Poisson Distribution problems.

CO3: Calculate Normal Distribution, Standard Normal distribution, Exponential Distribution Problems.

CO4: Evaluate the student's t and chi-square distributions and Density function.

CO5: Compute single, double mean test and Chi – Square test ANOVA test.

Subject Name: Environmental Studies

Year: II

Subject Code: ENV4B

Semester: IV

Unit 1: Introduction to Environmental Studies

- Multidisciplinary nature of environmental studies.
- Scope and importance, concept of sustainability and sustainable development.

Unit 2: Ecosystem

What is an Ecosystem? Structure and Function of Ecosystem; Energy flow in an Ecosystem; Food chains, Food webs and Ecological Succession,

- a) Case Studies of the following ecosystem:
- b) Forest Ecosystem
- c) Grassland Ecosystem
- d) Desert Ecosystem
- e) Aquatic Ecosystem (ponds, stream, lakes, rivers, ocean, estuaries)

Unit 3: Natural Resources: Renewable and Non- Renewable Resources

- Land resources and Land use change: Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over – exploitation of surface and ground water, floods, droughts, conflicts over water (international and interstate)
- Energy resources: Renewable and nonrenewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit 4: Biodiversity and Conservation

- Levels of biological diversity: Genetics, species and ecosystem diversity, biogeographic zones of India: biodiversity patterns and global biodiversity hotspots.
- India as a mega biodiversity nation, endangered and endemics species of India.
- Threats to biodiversity: Habitat loss, poaching of wild life, man- wild life conflicts, biological invasions; conservations of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and informational value.

Unit 5: Environmental Pollution

- Environmental Pollution: Types, causes, effects and controls: Air, water, soil and noise pollution.
- Nuclear Hazards and Human health risks.
- Solid waste management: Control measures of urban and industrial waste
- Pollution case studies.

Unit 6: Environmental Policies and Practices

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.
- Environment Laws: Environment protection act, air (prevention & control of pollution) act; water (prevention and control of pollution) act; wildlife protection act; forest

conservation act; International agreements; Montreal and Kyoto protocols and convention on biological diversity (CBD).

- Natural reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

Unit 7: Human Communities and the Environment

- Human population growth, impacts on environment, human health and welfare.
- Resettlement and rehabilitation of projects affected persons; case studies.
- Disaster management: Floods, earthquake, cyclone and landslides.
- Environmental movements: Chipko, Silent Valley, Bishnois of Rajasthan.
- Environmental Ethics: Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies (e.g. CNG Vehicles in Delhi)

Unit 8: Field Work

- Visit to an area to document environmental assets: river/forest/flora/fauna etc.
- Visit to a local polluted site – Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystem- pond, river, Delhi Ridge etc.

Suggested Readings:

1. Carson R 2002 Silent Spring Houghton Mifflin Harcourt
2. Gadgil M. & Guha R. 1993. This Fissured land: An Ecological History of India. Univ. of California Press.
3. Glesson B and Low N (eds.) 1999. Global Ethics and Environment, London Routledge.
4. Gleick P.H 1993. Water Crisis. Pacific Institute for Studies in Dev., Environment and Security. Stockholm Env. Institute, Oxford Univ. Press.

COURSE OUTCOME:

CO1: Evaluate interactions of environmental components

CO2: Describe Lithosphere, atmosphere, hydrosphere and biosphere.

CO3: Interpret interrelationships between landforms, weather, water and ecosystems.

Subject Name: Computer Network

Year: III
Semester: V

Unit - I

Introduction – Network Hardware - Software - Reference Models - OSI and TCP/IP Models – Example Networks: Internet, ATM, Ethernet and Wireless LANs - Physical Layer - Theoretical Basis for Data Communication - Guided Transmission Media.

Unit - II

Wireless Transmission - Communication Satellites - Telephone System: Structure, Local Loop, Trunks and Multiplexing and Switching. Data Link Layer: Design Issues - Error Detection and Correction.

Unit - III

Elementary Data Link Protocols - Sliding Window Protocols - Data Link Layer in the Internet – Medium Access Layer - Channel Allocation Problem - Multiple Access Protocols - Bluetooth.

Unit - IV

Network Layer - Design Issues - Routing Algorithms - Congestion Control Algorithms - IP Protocol – IP Addresses - Internet Control Protocols.

Unit - V

Transport Layer - Services - Connection Management - Addressing, Establishing and Releasing a Connection - Simple Transport Protocol - Internet Transport Protocols (ITP) - Network Security: Cryptography.

Text Book :

1. A. S. Tanenbaum, “Computer Networks”, Prentice-Hall of India 2008, 4th Edition.

Reference Books:

1. Stallings, “Data and Computer Communications”, Pearson Education 2012, 7th Edition.
2. B. A. Forouzan, “Data Communications and Networking”, Tata McGraw Hill 2007, 4th Edition.
3. F. Halsall, “Data Communications, Computer Networks and Open Systems”, Pearson Education 2008.
4. D. Bertsekas and R. Gallager, “Data Networks”, PHI 2008, 2nd Edition.
5. Lamarca, “Communication Networks”, Tata McGraw Hill 2002.

Web References:

- NPTEL & MOOC courses titled Computer Networks
- <https://nptel.ac.in/courses/106106091/>

Course Outcome:

CO1: Analyze different network models.

CO2: Discuss Wireless Transmission Techniques.

CO3: Describe, analyze and compare a number of data link, network and transport layer.

CO4: Analysing key networking protocols and their hierarchical relationship in the conceptual model like TCP/IP and OSI.

CO5: Discuss Network Security.

Subject Name: Operating System

Year: III
Semester: V

Unit – I

Introduction: Views - Types of System - OS Structure – Operations - Services – Interface- System Calls System Structure - System Design and Implementation. Process Management: Process – Process Scheduling - Inter-process Communication. CPU Scheduling: CPU Schedulers - Scheduling Criteria - Scheduling Algorithms.

Unit - II

Process Synchronization: Critical- Section Problem - Synchronization Hardware Semaphores – Classical Problems of Synchronization - Monitors. Deadlocks: Characterization - Methods for Handling Deadlocks - Deadlock Prevention - Avoidance - Detection - Recovery.

Unit - III

Memory Management: Hardware - Address Binding – Address Space - Dynamic Loading and Linking – Swapping – Contiguous Allocation - Segmentation - Paging – Structure of the Page Table.

Unit - IV

Virtual Memory Management: Demand Paging - Page Replacement Algorithms - Thrashing. File System: File Concept -. Access Methods - Directory and Disk Structure - Protection - File System Structures - Allocation Methods - Free Space Management.

Unit - V

I/O Systems: Overview - I/O Hardware - Application I/O Interface - Kernel I/O Subsystem - Transforming I/O Requests to Hardware Operations - Performance. System Protection: Goals - Domain - Access matrix. System Security: The Security Problem - Threats – Encryption- User Authentication.

Text Book:

1. Abraham Silberschatz, Peter B Galvin, Greg Gagne, “Operating System Concepts”, Wiley India Pvt. Ltd 2018, 9th Edition,.

References:

1. William Stallings, “Operating Systems Internals and Design Principles”, Pearson, 2018, 9th Edition.
2. Andrew S. Tanenbaum, Herbert Bos, “Modern Operating Systems”, Pearson 2014, 4th Edition.

Web References:

- NPTEL & MOOC courses titled Operating Systems
- <https://nptel.ac.in/courses/106106144/>

Course Outcome:

CO1: Describe the components of operating system, process management and CPU scheduling algorithms.

CO2: Analyze the concepts of operating system like process synchronization and deadlock.

CO3: Apply memory management techniques paging and segmentation schemes.

CO4: Develop file handing and protecting mechanism in Operating System.

CO5: Describe the concept of I/O system and secondary storage structures

Subject Name: Relational Database Management System

Year: III

Semester: V

Unit - I

Introduction to DBMS– Data and Information - Database – Database Management System – Objectives - Advantages – Components - Architecture. ER Model: Building blocks of ER Diagram – Relationship Degree – Classification – ER diagram to Tables – ISA relationship – Constraints – Aggregation and Composition – Advantages.

Unit - II

Relational Model: CODD's Rule- Relational Data Model - Key - Integrity – Relational Algebra Operations – Advantages and limitations – Relational Calculus – Domain Relational Calculus - QBE.

Unit - III

Structure of Relational Database. Introduction to Relational Database Design - Objectives – Tools – Redundancy and Data Anomaly – Functional Dependency - Normalization – 1NF – 2NF – 3NF – BCNF. Transaction Processing – Database Security.

Unit - IV

SQL: Commands – Data types – DDL - Selection, Projection, Join and Set Operations – Aggregate Functions – DML – Modification - Truncation - Constraints – Subquery.

Unit - V

PL/SQL: Structure - Elements – Operators Precedence – Control Structure – Iterative Control - Cursors - Procedure - Function - Packages – Exceptional Handling - Triggers.

Text Book:

1. S. Sumathi, S. Esakkirajan, "Fundamentals of Relational Database Management System", Springer International Edition 2007.
2. REFERENCE BOOKS:
 1. Abraham Silberchatz, Henry F. Korth, S. Sudarshan, "Database System Concepts", McGrawHill 2019, 7th Edition.
 2. Alexis Leon & Mathews Leon, "Fundamentals of DBMS", Vijay Nicole Publications 2014, 2nd Edition.

Web References:

1. NPTEL & MOOC courses titled Relational Database Management Systems
2. <https://nptel.ac.in/courses/106106093/>
3. <https://nptel.ac.in/courses/106106095/>

Course Outcome:

CO1: Describe the basic concepts of database system and ER model.

CO2: Design Relational model, Data model, Relational Algebra Operations, and Relational Calculus.

CO3: Implementing relational data base and normalization forms.

CO4: Apply SQL Commands for the given problem.

CO5: Analyze the PL/SQL structure, procedure, function, packages and triggers.

Subject Name: Operating System Lab

Year: III
Semester: V

Program List:

1. Basic I/O programming.
 To implement CPU Scheduling Algorithms:
2. Shortest Job First Algorithm.
3. First Come First Served Algorithm.
4. Round Robin and Priority Scheduling Algorithms.
5. To implement reader/writer problem using semaphore.
6. To implement Banker's algorithm for Deadlock avoidance.
 Program for page replacement algorithms:
7. First In First Out Algorithm.
8. Least Recently Used Algorithm.
9. To implement first fit, best fit and worst fit algorithm for memory management.
10. Program for Inter-process Communication.

Course Outcome:

- CO1:** Understand the process management policies.
CO2: Analyze the memory management and its allocation policies.
CO3: To evaluate the requirement for process synchronization.
CO4: Analyze the scheduling process algorithm by CPU
CO5: Understand Inter-Process Communication.

LIST OF EXERCISES

- 1) DDL commands with constraints.
- 2) DML Commands with constraints.
- 3) SQL Queries: Queries, sub queries, Aggregate function
- 4) PL/SQL : Exceptional Handling
- 5) PL/SQL : Cursor
- 6) PL/SQL : Trigger
- 7) PL/SQL : Packages
- 8) Design and Develop Application for Library Management
- 9) Design and Develop Application for Student Mark Sheet Processing
- 10) Design and Develop Application for Pay Roll Processing

Course Outcome:

CO1: Implement the DDL, DML Commands and Constraints.

CO2: Create, Update and query on the database.

CO3: Design and Implement simple project with Front End and Back End.

CO4: Understand queries in SQL to retrieve information from data base

CO5: Understand PL/SQL statements: Exception Handling, Cursors, and Triggers

Subject Name: Artificial Intelligence and Expert System

Year: III

Semester: V

Unit – I

Introduction: AI Problems – AI techniques – Criteria for success. Problems, Problem Spaces, Search: State space search – Production Systems – Problem Characteristics – Issues in design of Search.

Unit – II

Heuristic Search techniques: Generate and Test – Hill Climbing – Best-First, Problem Reduction, Constraint Satisfaction, Means-end analysis.

Unit- III

Knowledge representation issues: Representations and mappings – Approaches to Knowledge representations – Issues in Knowledge representations – Frame Problem.

Unit - IV

Using Predicate Logic: Representing simple facts in logic – Representing Instance and Is-a relationships – Computable functions and predicates – Resolution – Natural deduction.

Unit - V

Representing knowledge using rules: Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge Brief explanation of Expert Systems - Definition- Characteristics-architecture- Knowledge Engineering- Expert System Life Cycle-Knowledge Acquisition Strategies- Expert System Tools.

Text Book:

1. Elaine Rich and Kevin Knight, Shiva Shankar Nair, “Artificial Intelligence”, McGraw-Hill Companies, 3rd edition.

Reference Books:

1. Stuart Russell & Peter Norvig, “Artificial Intelligence A Modern Approach”, Pearson, 2nd Edition.
2. George F Luger, “Artificial Intelligence”, Pearson 2002, 4th Edition.
3. V S Janaki Raman, K Sarukesi, P Gopalakrishnan, “Foundations of Artificial Intelligence and Expert Systems”, MacMillan India limited.

Web References:

1. NPTEL & MOOC courses titled Artificial Intelligence and Expert Systems
2. <https://nptel.ac.in/courses/106106140/>
3. <https://nptel.ac.in/courses/106106126/>

Course Outcome:

CO1: Gain a working knowledge of the foundations of and modern applications.

CO2: Discuss on Artificial Intelligence heuristic search.

CO3: Discuss on Knowledge representation and Logical Agents.

CO4: Describe about Planning and Decision making.

CO5: Describe the Communication, Language processing, Perception of Robotics.

Subject Name: Value Education

Year: III
Semester: V

Unit I:

Value education - its purpose and significance in the present world – Value system – The role of culture and civilization – Holistic living – balancing the outer and inner – Body, Mind and Intellectual level – Duties and responsibilities.

Unit II:

Salient values for life – Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity, and inclusiveness, Self esteem and self confidence, punctuality – Time, task and resource management – Problem solving and decision making skills – Interpersonal and Intra personal relationship – Team work – Positive and creative thinking.

Unit III:

Human Rights – Universal Declaration of Human Rights – Human Rights violations – National Integration – Peace and non-violence – Dr.A P J Kalam's ten points for enlightened citizenship – Social Values and Welfare of the citizen – The role of media in value building.

Unit IV:

Environment and Ecological balance – interdependence of all beings – living and non-living. The binding of man and nature – Environment conservation and enrichment.

Unit V:

Social Evils – Corruption, Cyber crime, Terrorism – Alcoholism, Drug addiction – Dowry – Domestic violence – untouchability – female infanticide – atrocities against women – How to tackle them.

Books for Reference :

1. M.G. Chitakra: Education and Human Values, A.P.H. Publishing Corporation, New Delhi, 2003.
2. Chakravarthy, S.K: Values and ethics for Organizations: Theory and Practice, Oxford University Press, New Delhi, 1999.
3. Satchidananda, M.K: Ethics, Education, Indian Unity and Culture, Ajantha Publications, Delhi, 1991.
4. Das, M.S. & Gupta, V.K.: Social Values among Young adults: A changing Scenario, M.D. Publications, New Delhi, 1995.
5. Bandiste, D.D.: Humanist Values: A Source Book, B.R. Publishing Corporation, Delhi, 1999.
6. Ruhela, S.P.: Human Values and education, Sterling Publications, New Delhi, 1986.
7. Kaul, G.N.: Values and Education in Independent Indian, Associated Publishers, Mumbai, 1975.
8. NCERT, Education in Values, New Delhi, 1992.
9. Swami Budhananda (1983) How to Build Character A Primer : Rmakrishna Mission, New Delhi.
10. A Culture Heritage of India (4 Vols.), Bharatiya Vidya Bhuvan, Bombay, (Selected Chapters only)
11. For Life, For the future : Reserves and Remains – UNESCO Publication.
12. Values, A Vedanta Kesari Presentation, Sri Ramakrishna Math, Chennai, 1996.
13. Swami Vivekananda, Youth and Modern India, Ramakrishna Mission, Chennai.

14. Swami Vivekananda, Call to the Youth for Nation Building, Advaita Ashrama, Calcutta.
15. Awakening Indians to India, Chinmayananda Mission, 2003.

Course Outcome:

- CO1:** Discuss Self-esteem, ego, anger manifestation, Indian ethos in ethics and individuals personality in the eyes of others
- CO2:** Describe Leadership, ethical business decisions, basic principles of professional ethics and mass media ethics.
- CO3:** Explain Effects of advertising, value of faith, social awareness and commitment and the steps for the protection of environment
- CO4:** Analyse Impact of globalization and consumer awareness, signs for an everlasting peace, evolution of human rights and the international law in operation
- CO5:** Discuss Intellectual activities and responsibility of citizen.

Subject Name: Software Engineering

Year: III

Semester: VI

Unit- I

Introduction – Evolution – Software Development projects – Emergence of Software Engineering. Software Life cycle models – Waterfall model – Rapid Application Development – Agile Model – Spiral Model.

Unit- II

Requirement Analysis and Specification – Gathering and Analysis – SRS – Formal System Specification.

Unit- III

Software Design – Overview – Characteristics – Cohesion & Coupling – Layered design – Approaches Function Oriented Design – Structured Analysis – DFD – Structured Design – Detailed design.

Unit- IV

Object Modeling using UML – OO concepts – UML – Diagrams – Use case, Class, Interaction, Activity, State Chart – Postscript.

Unit- V

Coding & Testing – coding – Review – Documentation – Testing – Black-box, White-box, Integration, OO Testing, Smoke testing.

Text Book:

1. Rajib Mall, “Fundamentals of Software Engineering”, PHI 2018, 5th Edition.

Reference Books:

1. Roger S. Pressman, “Software Engineering - A Practitioner’s Approach”, McGraw Hill 2010, 7th Edition.
2. Pankaj Jalote, “An Integrated Approach to Software Engineering”, Narosa Publishing House 2011, 3rd Edition.

WEB REFERENCES:

□ NPTEL online course – Software Engineering - <https://nptel.ac.in/courses/106105182/>

Course Outcome:

CO1: Describe phases of software development life cycle.

CO2: The students should be able to specify software requirements, design the software using Tools

CO3: Develop the product with structured coding techniques.

CO4: Apply different design concepts, notations and techniques.

CO5: To write test cases using different testing techniques.

Subject Name: Introduction To Data Science

Year: III

Semester: VI

Unit-I

Introduction to Data Science – Benefits and uses – Facets of data – Data science process – Big data ecosystem and data science

Unit-II

The Data science process – Overview – research goals - retrieving data - transformation – Exploratory Data Analysis – Model building

Unit-III

Algorithms - Machine learning algorithms – Modeling process – Types – Supervised – Unsupervised - Semi-supervised.

Unit-IV

Introduction to Hadoop – framework – Spark – replacing MapReduce– NoSQL – ACID – CAP – BASE – types.

Unit-V

Case Study – Prediction of Disease - Setting research goals - Data retrieval – preparation - exploration - Disease profiling - presentation and automation.

Text Book:

1. Davy Cielen, Arno D. B. Meysman, Mohamed Ali, “Introducing Data Science”, manning publications 2016.

Reference Books:

1. Roger Peng, “The Art of Data Science”, lulu.com 2016.
2. MurtazaHaider, “Getting Started with Data Science – Making Sense of Data with Analytics”, IBM press, E-book.
3. Davy Cielen, Arno D.B. Meysman, Mohamed Ali, “Introducing Data Science: Big Data, Machine Learning, and More, Using Python Tools”, Dreamtech Press 2016.
4. Annalyn Ng, Kenneth Soo, “Numsense! Data Science for the Layman: No Math Added”, 2017, 1st Edition.
5. Cathy O'Neil, Rachel Schutt, “Doing Data Science Straight Talk from the Frontline”, O'Reilly Media 2013.
6. Lillian Pierson, “Data Science for Dummies”, 2017, 2nd Edition.

Web References

□ NPTEL online course– Data Science for Engineers - <https://nptel.ac.in/courses/106106179/>

Course Outcome:

CO1: To describe what Data Science is, what Statistical Inference means, identify probability Distributions

CO2: Discuss research goals and data transformation.

CO3: Understand Modeling process

CO4: Use tools for basic analysis and communication.

CO5: Discuss research goal setting.

Subject Name: Introduction To Cloud Computing

Year: III

Semester: VI

Unit - I

Cloud Computing Foundation: Introduction to Cloud Computing – Move to Cloud Computing – Types of Cloud – Working of Cloud Computing

Unit - II

Cloud Computing Architecture : Cloud Computing Technology – Cloud Architecture – Cloud Modeling and Design - Virtualization : Foundation – Grid, Cloud and Virtualization – Virtualization and Cloud Computing

Unit - III

Data Storage and Cloud Computing : Data Storage – Cloud Storage – Cloud Storage from LANs to WANs – Cloud Computing Services : Cloud Services – Cloud Computing at Work

Unit - IV

Cloud Computing and Security : Risks in Cloud Computing – Data Security in Cloud – Cloud Security Services – Cloud Computing Tools : Tools and Technologies for Cloud – Cloud Mashups – Apache Hadoop – Cloud Tools

Unit - V

Cloud Applications – Moving Applications to the Cloud – Microsoft Cloud Services – Google Cloud Applications – Amazon Cloud Services – Cloud Applications

Text Book:

1. A.Srinivasan and J.Suresh, “Cloud Computing – A Practical Approach for Learning and Implementation”, Pearson India Publications 2014.

Reference Book:

1. Rajkumar Buyya, James Broberg, Andrzej, “Cloud Computing: Principles and Paradigms”, Wiley India Publications 2011.
2. Arshdeep Bahga and Vijay Madisetti, “Cloud Computing – A Hands on Approach”, Universities Press (India) Pvt Ltd. 2014.

Web References:

- NPTEL & MOOC courses titled Cloud computing
- <https://nptel.ac.in/courses/106105167/>

Course Outcome:

CO1: To gain knowledge about Cloud Computing

CO2: To describe cloud architecture.

CO3: To explain and apply levels of services of Cloud.

CO4: To describe the security aspects in cloud.

CO5: To understand about cloud application.

Subject Name: Case Tools And Testing Tools Lab

Year: III
Semester: VI

List Of Exercises:

1. Using UML tools produce analysis and design models for
 - a. Library Management System
 - b. Automatic Teller Machine
 - c. Student Information Management
 - d. Matrimony Service
 - e. Stock Management System
2. Study of Open source testing tools (eg. Selenium, WATIS, Apache JMeter, TestNG)

Course Outcome:

- CO1:** Students must be able to analyze and design the problem at hand.
- CO2:** Students should be able to use UML tools for the designing the software and test the correctness and soundness of their software through testing tools..
- CO3:** Able to use Selenium.
- CO4:** Able to use Apache JMeter, TestNG.
- CO5:** Demonstrate the importance of testing and its role in need of software development..

Subject Name: Mini Project

Year: III

Semester: VI

Project planning:

B.Sc (Computer Science / Software Application)/BCA Major Project is an involved exercise, which has to be planned well in advance. The topic should be chosen in the beginning of final year itself. Related reading training and discussions of first internal project viva voce should be completed in the first term of final year.

I Selection of the project work

Project work could be of three types.

a) Developing solution for real life problem

In this case a requirement for developing a computer-based solution already exists and the different stages of system development life cycle is to be implemented successfully. Examples are accounting software for particular organization, computerization of administrative function of an organization, web based commerce etc.

b) System Software Project

Projects based on system level implementation. An example is a Tamil language editor with spell checker, compiler design.

c) Research level project

These are projects which involve research and development and may not be as structured and clear cut as in the above case. Examples are Tamil character recognition, neural net based speech recognizer etc. This type of projects provides more challenging opportunities to students.

II Selection of team

To meet the stated objectives, it is imperative that major project is done through a team effort. Though it would be ideal to select the team members at random and this should be strongly recommended, due to practical consideration students may also be given the choice of forming themselves into teams with three members. A team leader shall be selected. Team shall maintain the minutes of meeting of the team members and ensure that tasks have been assigned to every team member in writing. Team meeting minutes shall form a part of the project report. Even if students are doing project as groups, each one must independently take different modules of the work and must submit the report.

III Selection of Tools

No restrictions shall be placed on the students in the choice of platform/tools/languages to be utilized for their project work, though open source is strongly recommended, wherever possible. No value shall be placed on the use of tools in the evaluation of the project.

IV Project management

Head of the Department / Principal of the college should publish the list of student's project topic, internal guide and external organization and teams agreed before the end of July. Changes in this list may be permitted for valid reasons and shall be considered favorably by the Head of the department / Principal of the college any time before commencement of the project. Students should submit a fortnightly report of the progress, which could be indication

of percentage of completion of the project work. The students should ideally keep a daily activity book. Team meeting should be documented and same should be submitted at the end of the project work.

V Documentation

Three copies of the project report must be submitted by each student (one for department library, one for the organization where the project is done and one for the student himself/herself). The final outer dimensions of the project report shall be 21cm X 30 cm. The color of the flap cover shall be light blue. Only hard binding should be done. The text of the report should be set in 12 pt, Times New Roman, 1.5 spaced.

Headings should be set as follows:

CHAPTER HEADINGS 16 pt, Arial, Bold, All caps, Centered.

1. Section Headings 14 pt Bookman old style, Bold, Left adjusted.

1.1 Section Sub-heading 12 pt, Bookman old style.

Title of figures tables etc are done in 12 point, Times New Roman, Italics, centered.

Content of the Project should be relevant and specify particularly with reference to the work. The report should contain the requirement specification of the work, Analysis, Design, Coding, testing and Implementation strategies done.

- Organizational overview (of the client organization, where applicable)
- Description of the present system
- Limitations of the present system
- The Proposed system - Its advantages and features
- Context diagram of the proposed system
- Top level DFD of the proposed system with at least one additional level of expansion
- Program List (Sample code of major functions used)
- Files or tables (for DBMS projects) list. List of fields or attributes (for DBMS projects) in each file or table.
- Program – File table that shows the files/tables used by each program and the files are read, written to, updated, queried or reports were produced from them.
- Screen layouts for each data entry screen.
- Report formats for each report.

Some general guidelines on documentation are:

1. Certificate should be in the format: "Certified that this report titled.....is a bonafide record of the project work done by Sri/ Kumunder our supervision and guidance, towards partial fulfillment of the requirement for award of the Degree of B.Sc Computer Science/BCA/BSc Software Applications of XXX College" with dated signature of internal guide, external guide and also Head of the Department/ College.

2. If the project is done in an external organization, another certificate on the letterhead of the organization is required: "Certified that his/her report titledis a bonafide record of the project work done by Sri/Kum.....under my supervision and guidance, at thedepartment of..... (Organization) towards partial fulfillment of the requirement for the award of the Degree of B.Sc (Computer Science/Software Applications) / BCA of XXX College.

3. Page numbers shall be set at right hand bottom, paragraph indent shall be set as 3.

4. Only 1.5 space need be left above a section or subsection heading and no space may be left

after them.

5. References shall be IEEE format (see any IEEE magazine for detail) While doing the project keep note of all books you refer, in the correct format and include them in alphabetical order in your reference list.

VI Project Evaluation:

Internal Assessment

There shall be six components that will be considered in assessing a project work with weightage as indicated.

1. Timely completion of assigned tasks as evidenced by team meeting minutes 20%
2. Individual involvement, team work and adoption of industry work culture 10%
3. Quality of project documentation (Precision, stylistics etc) 10%
4. Achievement of project deliverables 20%
- 5 Effective technical presentation of project work 10%
6. Viva 30%

Based on the above 6 components internal mark 40 can be awarded.

External Assessment

Dissertation/Project submitted at the end of third year shall be valued by two examiners appointed by the Controller for the conduct of practical exam. The board of examiners shall award 60 marks based on the following components.

1. Achievement of project deliverables - 20 Marks
2. Effective technical presentation of project work - 20 Marks
3. Project Viva - 20 Marks

There shall be a common written examination conducted for all the candidates in each group together for a minimum of 10 minutes.

- (i) Requirement Specification of Project
- (ii) Design of Project
- (iii) Testing and Implementation of Project

Course Outcome:

CO1: Identify problem domain and application domain.

CO2: Analyze requirements and initial planning.

CO3: Design theory, data structures and algorithm.

CO4: Implement and test the project.

CO5: Summarize.

Unit – I

IoT & Web Technology, The Internet of Things Today, Time for Convergence, Towards the IoT Universe, Internet of Things Vision, IoT Strategic Research and Innovation Directions, IoT Applications, Future Internet Technologies, Infrastructure, Networks and Communication, Processes, Data Management, Security, Privacy & Trust, Device Level Energy Issues, IoT Related Standardization, Recommendations on Research Topics.

Unit - II

M2M to IoT – A Basic Perspective– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. M2M to IoT-An Architectural Overview– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.

Unit - III

IoT Architecture -State of the Art – Introduction, State of the art, Architecture. Reference Model Introduction, Reference Model and architecture, IoT reference Model, IoT Reference Architecture Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views.

Unit - IV

IoT Applications for Value Creations Introduction, IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications, Four Aspects in your Business to Master IoT, Value Creation from Big Data and Serialization, IoT for Retailing Industry, IoT For Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management, eHealth.

Unit - V

Internet of Things Privacy, Security and Governance Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security.

Text Book:

1. Vijay Madisetti and ArshdeepBahga, “Internet of Things: (A Hands-on Approach)”, Universities Press (INDIA) Private Limited 2014, 1st Edition.

Reference Books:

1. Michael Miller, “The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World”, Pearson Education 2015.
2. Francis da Costa, “Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”, Apress Publications 2013, 1st Edition.
3. Waltenegus Dargie, Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice", Wiley 2014.
4. CunoPfister, “Getting Started with the Internet of Things”, O’Reilly Media 2011.

Web References:

□ <https://github.com/connectIOT/iottoolkit>

- <https://www.arduino.cc/>
- <http://www.zettajs.org/>

Course Outcome:

CO1: Discuss importance of IoT .

CO2: Design IoT applications in different domain and be able to analyze their performance.

CO3: Implement basic IoT applications on embedded platform.

CO4: Able to understand the applications areas of IoT.

CO5: Understand the IoT Privacy, Security and Governance.