122CAT01 APPLIED STATISTICS FOR DATA ANALYSIS

COURSE OBJECTIVES :

- To learn the basic concepts of statistics like frequency distributions, graphical representations and curve fitting.
- To impart the knowledge of statistical measures of central tendency and dispersion.
- To introduce the notion of sampling distributions and acquire the knowledge of statistical techniques useful in decision making.
- To expose the statistical methods for analysis of variance and control limits.
- To study the statistical tools of data analysis such as Correlation, Regression, Principal Component analysis.

UNIT – I STATISTICAL DATA REPRESENTATIONS   9+3

Frequency distributions of data: cumulative and relative frequency distributions- Graphical representation of data – Pie charts, Bar graphs, Histogram, Frequency Polygon and Ogives.

UNIT - II QUANTITATIVE STASTICAL MEASURES   9+3

Measures of Central tendency: Arithmetic Mean, Median, Mode - Measures of Dispersion: Range, Quartile deviation, Standard deviation, Variance and Co-efficient of Variation.

UNIT – III TESTING OF HYPOTHESIS   9+3

Sampling distributions – Testing of hypothesis for large samples by Z-test and small samples by Student's t-test for single Mean, Proportion, equality of means and equality of proportions – F-test for single variance and equality of variances – Chi-square test for Goodness of fit and Independence of attributes.

UNIT - IV   DESIGN OF EXPERIMENTS   9+3

 ANOVA(Analysis of variance) – Completely Randomized Design(CRD-one way classification) – Randomised Block Design (RBD-two way classification) - Latin Square Design (LSD-Three way classification) - Control charts for measurements: mean chart or $\bar{x}$ - chart, R- chart.

UNIT - V DATA ANALYSIS   9+3

Correlation analysis : Karl Pearson's Coefficient of Correlation - Regression Analysis: Least Square fit of a Linear Regression -Two lines of Regression - Multivariate Analysis: Random vectors and matrices - mean vectors and covariance matrices – multivariate normal density function- Principal Component Analysis - Population Principal Components.

Total No. of Periods : 45 + 15

Note : *Use of approved statistical table is permitted in the examination.*

COURSE OUTCOMES :

CO1 : Represent and interpret statistical data through bar graphs, pie graphs, histograms, frequency polygons and ogives.

CO2 : Calculate the measure of Central tendencies and Dispersion of the frequency distributions of data.

CO3 : Draw conclusions through hypothesis testing.

CO4 : Acquaint with the knowledge of analysis of variance for decision making and analyse the control limits of a sample.

CO5 : Apply statistical tools of data analysis such as Correlation, Regression, Principal Component analysis.

REFERENCES :

1. Gupta.S.C., & Kapoor,V.K., "Fundamentals of mathematical statistics", 11th edition, Sultan Chand & Sons publishers, New Delhi, 2013.

2. Levin R.I., Rubin S. David, "Statistics for Management", Eight edition, Pearson, 2017.
   [e-resource: Levin R.I., Rubin S. David, "Statistics for Management", Pearson, 2019].

3. Veerarajan.T., "Probability, Statistics and Random Processes", Tata McGraw-Hill publishing company Limited, New Delhi, 2014.

4. R.E. Walpole, R.H. Myers, S.L. Myers, and K Ye, "Probability and Statistics for Engineers and Scientists", Pearson Education, Asia , 8th edition, 2007.

5. Miller and Freund., "Probability and Statistics for Engineers", Pearson Education, Asia, 7th edition, 2012.

6. Arora.P.N. and Arora.S., "Statistics for Management", S.Chand & Company Ltd, 2009.

7. Keller, G, "Statistics for Management and Economics", Cengage Learning (Textbook/ eBook), 2019.

122CAT02 PYTHON PROGRAMMING

COURSE OBJECTIVES :

- To Develop python program using conditional and looping statement
- To implement python data structure – List, tuples, dictionary
- To process various file operations and exception handling.
- To define class and integrate database with python
- To execute modules, packages and framework.

UNIT – I INTRODUCTION   9

Introduction to Python Programming: Python Interpreter and Interactive Mode – Variables and Identifiers – Arithmetic Operators – Values and Types – Statement. Operators: – Boolean Values – Operator Precedence – Expression. Conditionals: If- Else Constructs – Loop / Structures / Iterative Statement – While Loop – For Loop – Break Statement – Continue Statement –Function Call and return values – Parameter Passing – Local and Global Scope – Recursive Function.

UNIT – II DATA TYPES   9

List and its Operation – Tuples – Dictionary – Sets – Advanced List Processing – List Comprehensive – Filtering – Modules: Module Loading Execution – Packages – Making your own Module – The Python Standard Libraries.

UNIT - III FILE HANDLING AND EXCEPTION HANDLING   9

Files – Introduction – File Path – Opening and Closing Files – Reading and Writing Files – File Position – Exception: Error and Exceptions – Exception Handling and Multiple Exceptions

UNIT – IV OOC AND DB INTEGRATION IN PYTHON   9

Introduction to OOC – Class and Methods – Encapsulation – Inheritance – Polymorphism – Class Methods Vs Static Methods – Python Object Persistence – Built-in Functions – Python and MySql Database Integration – Connect Database – Create and Insert Operation – Parameter Passing and Retrieving from the database.

UNIT – V MODULES, PACKAGES AND FRAMEWORKS   9

Modules – Introduction – Module Loading and Execution – Packages – Making your own Module – The Python Libraries for Data Processing, Data Mining and Visualization – NumPy- Pandas – Matplotlib – Frameworks – Django – Flask – Web2py

Total No. of Periods : 45

COURSE OUTCOMES :

CO1 : Develop a solution to simple computation problem
CO2 : Represent Compound Data Structure using python list, tuples and dictionaries.
CO3 : Design and Develop an application based on the File operation.
CO4 : Develop an application with Database Integrations
CO5 : Implement of an application with Modules, Packages and Frameworks

REFERENCES :

1. James Payne, "Beginning Python", Wrox Programming to Progammer, second editon 2018.
2. Fabrizio Romano,"Learn Python Programming", Second Edition, Paktr Publication, 2018
3. Ashok Namdev Kamthane, Amit Ashok Kamthane,"Python programming", McGrawHill Publication,2018
4. Brian Draper, "Python Programming -A Complete Guide for Beginners to Master and Become an Expert in Python Programming Language", Create Space Independent Publishing Platform,2016
5. John M. Stewart, "Python for Scientists", Cambridge University Press, 2015.
6. Mitch Garnaat, "Python and AWS Cookbook", First Edition, O'Reilly Media, Inc., 2012.
7. Allen B. Downey, ``Think Python: How to Think Like a Computer Scientist '', 2nd edition, Updated for Python 3, Shroff/O 'Reilly Publishers, 2016
8. Guido van Rossum and Fred L. Drake Jr, ―An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd., 2011.

122CAT03 DATABASE MANAGEMENT SYSTEMS

COURSE OBJECTIVES:

- Knowledge of DBMS, both in terms of use and implementation/design
- Understand the areas of database design, SQL and programming
- Understand relational and object oriented database technology for building applications for the current trend
- Evaluate a business situation and designing & building a database applications
- To understand the concept of file and indexing.

UNIT – I INTRODUCTION 9

File systems versus Database systems – Data Models – DBMS Architecture – Data Independence – Data Modeling using Entity – Relationship Model – Enhanced E-R Modeling.

UNIT – II RELATIONAL MODEL AND QUERY EVALUATION 9

Relational Model Concepts – Relational Algebra – SQL – Basic Queries – Complex SQL Queries – Joins -Views – Constraints – Partitions - Dynamic SQL, Other SQL Functions, overview of commercial RDBMSs – Database Design – Functional Dependencies – Normal Forms –1NF – 2NF-3NF-BCNF – 4NF-5NF - Algorithms for Executing Query Operations– Query Processing–Overview– Measures of Query Cost.

UNIT – III TRANSACTION PROCESSING 9

Transaction Processing – Properties of Transactions –Serializability– Transaction support in SQL – Time Stamp ordering – Recovery concepts – Shadow paging, Buffer Management – Log Based Recovery – Database Security Issues – Access control.

UNIT – IV FILES AND INDEXING 9

File Structures – Disks – RAID-File operations – Hashing Techniques – Indexing – Single level and Multi-level Indexes – B+ tree – Static Hashing - Indexes on Multiple Keys.

UNIT - V SPECIAL PURPOSE DATABASES 9

Basic Concepts: Distributed Databases DBMS Architecture, Architecture of Parallel Databases, Database design for ORDBMS - The ODMG Data Model and ODL

Total No. of Periods : 45

COURSE OUTCOMES :

CO1 : To learn the basic concepts of DBMS
CO2 : To Know the concepts of SQL
CO3 : To understand PL/SQL, Triggers and cursors
CO4 : To know the concept of Normalization
CO5 : To implement ORDBMS

REFERENCES

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan , "Database System Concepts", McGraw-Hill Education, 2019 ·
2. Ramez Elamassri and Shankant B-Navathe, "Fundamentals of Database Systems", Sixth Edition, Pearson Education Delhi, 2010.
3. Raghu Ramakrishnan, Johannes Gehrke ,' Database management systems", McGraw, Hill, 6rd Edition, 2014.
4. Frank. P. Coyle, "XML Web Services and the Data Revolution", Pearson Education, 2012.
5. Lee Chao, "Database Development and Management", Auerbach Publications, 2016.

122CAT04 DATA STRUCTURES AND ALGORITHMS

COURSE OBJECTIVES :

- To Understand the Basic Linear Data Structures
- To Learn and use Non Linear Data Structures
- To gain the knowledge of Sorting and Searching techniques
- To understand the fundamental concepts of Graphs.
- To design and analysis of algorithm.

UNIT - I LINEAR DATA STRUCTURES   9

Introduction – Abstract Data Types- Array and its Representation – Stack ADT – Application of Stack – Queue ADT- Application of Queue – Linked List – Doubly Linked List – Circular Linked List – Application of Linked List.

UNIT – II NON LINEAR DATA STRUCTURES   9

Tree and its Representation – Binary Tree – Search Tree ADT- Binary Search Trees – Huffman's Algorithm – AVL Tree – Threaded Binary Tree – Splay Tree – B-Tree.

UNIT - III SORTING AND SEARCHING   9

Sorting – Internal Sorting – Bubble Sort - Quick Sort – Insertion Sort - Heap Sort - External Sorting – Merge Sort – Multi-way Sort – Basic Searching Techniques – Tree Searching and Hashing.

UNIT - IV GRAPHS   9

Graphs – Representation of Graphs – Graph Traversal – Depth First Traversal – Breadth First Traversal – Shortest Path Algorithm – Minimum Spanning Tree – Prims and Kruskal's Algorithms.

UNIT - V ALGORITHM DESIGN AND ANALYSIS   9

Algorithm Analysis – Asymptotic Notations – Divide and Conquer Technique – Greedy Algorithms – Knapsack Problem – Dynamic Programming – Warshall Algorithm – Backtracking – Sum of Subset Problem.

Total No. of Periods : 45

COURSE OUTCOMES :

CO1 : Able to Choose appropriate linear data structures and implement to problem definition.
CO2 : Able to manage the non-linear data structures
CO3 : Implement Sorting and searching techniques in the real time applications
CO4 : Design an algorithm for graph structures.
CO5 : Able to analysis and design various algorithms.

REFERENCE BOOKS :

1. M. A. Weiss, "Data Structures and Algorithm Analysis in C++", Pearson Education Asia, 2013.
2. Tanaenbaum A.S.,Langram Y. Augestein M.J " Data Structures using C" Pearson Education , 2004.
3. Anany Levitin "Introduction to the Design and Analysis of Algorithms" PearsonEducation 2003.E. Horowitz, S.Sahni and Dinesh Mehta, "Fundamentals of Data structures in C++",University Press, 2007.
4. E. Horowitz, S. Sahni and S. Rajasekaran, "Computer Algorithms/C++", Second Edition,University Press, 2007.
5. Reema Thareja, "Data Structures using C", Oxford Press, 2012.
6. V. Aho, J. E. Hopcroft, and J. D. Ullman, "Data Structures and Algorithms", Pearson Education, 1983.
7. T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, "Introduction to algorithms", Second Edition.

122CAT05 RESEARCH METHODOLOGY

COURSE OBJECTIVES :
- To Understand the Basic Good Research
- Learn to design the research.
- To gain the knowledge of Measurement and methods for data collections
- To Understand the Hypothesis Standard.
- To design and analysis of Interpretation and report writing.

UNIT - I INTRODUCTION   9

Meaning of Research- Objective of Research – Motivation of Research – Types of Research – Research Approaches – Significance of Research – Research Methods Vs Research Methodology – Research Process – Criteria of Good Research – Research Problem – Selecting the problem – The Techniques involved in defining the problem.

UNIT - II RESEARCH DESIGN   9

Meaning of Research Design – Need for Research Design – Features of Good Design – Different Research Design – Basic Principles of Experimental Design – Census and Sample Survey – Implications of a Sample Design – Steps in Sampling Design – Criteria of Selecting a sample procedure – Characteristics of Good Sample Design – Different types of Sample Design.

UNIT – III MEASUREMENT AND METHODS FOR DATA COLLECTIONS   9

Measurement in Research – Scales – Error Measurement – Types of Measurement – Techniques of Developing Measurement tools – Scaling – Meaning of Scaling –Scale Classification bases – Scaling Techniques – Collection of Primary Data – Observation –Interview Method – Collection of Data Through Questionnaires – Data Through Schedules – Difference between Questionnaires and Schedules.

UNIT – IV HYPOTHESIS STANDARD   9

Hypothesis – Basic Concepts – Procedure – Flow Diagram – Tests of Hypotheses – Parametric Test – Hypothesis Testing: Means – Difference between means – Comparing two related samples – proportions – difference between proportions – Comparing a variance –Correlation Coefficients – Limitation of the Tests of Hypothesis.

UNIT – V INTERPRETATION AND REPORT WRITING   9

Meaning of Interpretations – Technique of Interpretation – Precaution in Interpretation – Significance of Report Writing – Different Steps in Writing Report – Layout of the Research Report – Types of Reports – Oral Presentation – Mechanics of Writing a Research Report – Precautions for Writing Research Reports.

Total No. of Periods : 45

COURSE OUTCOMES :

CO1 : Able to understand the good research design.
CO2 : Able to learn the research design
CO3 : Implementation of Measurement and Methods for Data Collections
CO4 : Design an Effective Hypothesis Standard.
CO5 : Able to analysis and Write a Report with Interpretations.

REFERENCE BOOKS :

1. C.R. Kothari, "Research Methodology Methods and Techniques", A New Age International Publishers, Second Edition, 2004
2. Dr. Shanthi Busan Misra, Dr. Shashi Alok, "Hand Book of Research Methodology A Compendium for Scholars and Researchers' Educreation, 2011.
3. R. Paneerselvam, "Research Methodology", Second Edition, PHI Learning Private Limited, 2014.
4. Cooper Donald R, Schindler Pamela S and Sharma JK, "Business Research Methods", Tata McGraw Hill Education, 11e 2012.
5. Ranjith Kumar, "Research Methodology a Step by Step Guide for Beginner", Third Edition, SAGE Publication, 2014.

122CAP01 DATABASE MANAGEMENT SYSTEMS LAB

COURSE OBJECTIVES :

- To understand the concepts of DBMS.
- Populate and query a database using SQL DDL/DML Commands
- Declare and enforce integrity constraints on a database
- Writing Queries using advanced concepts of SQL
- Programming PL/SQL including procedures, functions, cursors and triggers

LIST OF EXPERIMENTS

1. Execute all DDL, DML and DCL commands on sample tables.
2. Implementation of different types of operators and built-in functions with suitable examples
3. Implementation of different types of joins with suitable examples
4. Create views, partitions, Sequence, Indexes and locks
5. Implement different types of constraints on relations.
6. Implementation of sub queries and nested queries.
7. Implement Queries on Group By & Having Clauses, ALIAS, Sequence By, Order By
8. a) Write a PL/SQL block for IF, IF and else condition
   b) Write a PL/SQL block for implementation of loops
   c) Write a PL/SQL block for greatest of three numbers using IF ANDELSEIF
9. Exception Handling-Implement the following with respect to exception handling.
   a) Raising Exceptions
   b) User Defined Exceptions
   c) Pre-Defined Exceptions
10. Write PL/SQL block for an application using exception handling Procedures
    a) Write a PL/SQL Procedure using Positional Parameters
    b) Write a PL/SQL Procedure using notational parameters
    c) Write a PL/SQL Procedure for GCD Numbers
    d) Write a PL/SQL Procedures for cursor implementation (explicit and implicit cursors)
11. Functions:
    a) Write a PL/SQL block to implement factorial using functions
    b) Write a PL/SQL function to search an address from the given database
12. Write a DBMS program to prepare Pl/SQL reports for an application using functions.
    a) Write a Trigger to pop-up the DML operations
    b) Write a Trigger to check the age valid or not Using Message Alert.
    c) Create a Trigger to Raise appropriate error code and error message.
    d) Create a Trigger on a table so that it will update another table while inserting values
13. Write PL/SQL block for an application using cursors and all types of triggers.
14. Write a PL/SQL block for transaction operations of a typical application using package

Total No. of Periods : 60

COURSE OUTCOMES :

CO1 : Design and Implement databases
CO2 : Utilize SQL to execute queries for creating database and performing data manipulation operations
CO3 : Examine integrity constraints to build efficient databases
CO4 : Apply Queries using Advanced Concepts of SQL
CO5 : Build PL/SQL programs including stored procedures, functions, cursors and triggers

122CAE01 SOFTWARE ENGINEERING

COURSE OBJECTIVES :

- To provide an insight into the processes and models of software development.
- To understand the problem domain for developing SRS and various models of Software Engineering.
- To model Software Projects into high level design using DFD, UML diagrams
- To analyse and evaluate the user interface design
- To measure Quality and to categorize testing methods.

UNIT - I SOFTWARE PROCESS   9

Introduction-Nature of Software-Software Engineering- Importance of Software Engineering-Software Engineering Life Cycle-Software Process-Software Myths, Generic Process Model-Prescriptive Process model: The Waterfall-Incremental-Evolutionary-Concurrent Models-Specialized Process Models-Component based developments-Formal Methods Model-Aspect Oriented Software Development-The Unified Process-Agile Software Development Model.

UNIT - II SOFTWARE REQUIREMENTS   9

Requirements Engineering: Establishing the Groundwork-Requirements Elicitation-Building the Requirements Model-Negotiating and Validating Requirements-Requirement Analysis-Scenario Based Modeling-Data Modeling Concepts-Class based Modeling-Requirement Modeling Strategies-Flow Oriented Modeling-Creating a Behavioural Model-Patterns for Requirement Modeling.

UNIT - III DESIGN CONCEPTS AND ARCHITECTURE   9

Design Process-Design Concepts and Design Models. Architectural Design: Software Architecture-Architecture Genres-Architectural Styles-Architectural Patterns-Architectural Design-Defining Archetypes-Refining Architecture into Components-Assessing Alternative Architectural Design-Architectural Mapping using dataflow.

UNIT - IV COMPONENT-LEVEL AND USER INTERFACE DESIGN   9

Component-Level Design: Definition of Component-Designing Class Based Components-Conducting Component Level Design-User Interface Design: The Golden Rules-User Interface Analysis and Design. Interface Analysis-Interface Design Steps-Design Evaluation-Pattern Based Design-Design Patterns-User Interface Design Patterns.

UNIT - V SOFTWARE QUALITY AND SOFTWARE TESTING   9

Software Quality- Achieving Software Quality- Quality Control-Quality Assurance-Software Testing-Importance of Software Testing- Software Testing Strategies-A Strategic Approach to Software Testing-Test Strategic for Conventional Software-Unit Testing-Integration Testing-Validation Testing-System Testing- White box Testing-Basis Path Testing-Control Structure Testing-Black box Testing- Case Study – Testing Tool – Eclipse IDE – Selenium IDE.

Total No. of Periods : 60

COURSE OUTCOMES :

CO1 : Get an insight into the processes and models of software development.
CO2 : Understand the problem domain for developing SRS and various models of Software Engineering.
CO3 : Ability to model Software Projects into high level design using DFD, UML diagrams
CO4 : Able to analyse and evaluate the user interface design
CO5 : Understand the need for Quality and categorize testing methods

REFERENCES

1. Roger S. Pressman, "Software Engineering: A Practitioner's Approach, Tata McGraw-Hill Education, 8th Edition, 2015
2. Watts S. Humphrey, "A Discipline for Software Engineering", Pearson Education, Edition 2007.
3. James F Peters and Witold Pedrycz," Software Engineering-An Engineering Approach: John Wiley and Sons, New Delhi, 2009.
4. Shari Lawrence Pfleeger, Joanne M. Atlee, "Software Engineering: Theory and Practice", Fourth Edition, Pearson Education, 2010.
5. Ian Sommerville, "Software Engineering", Ninth Edition, Pearson Education, 2011

122CAE02 COMPUTER NETWORKS

COURSE OBJECTIVES :

- To learn the fundamental concept of OSI Layer, Networks and Protocol standards.
- To understand about Wired and Wireless Network in Data Link Layer
- To Explore the concept of Network Protocol and Routing
- To Know the basic concept of Transport Layer
- To understand basic skill in Application Layer.

UNIT - I DATA COMMUNICATION 9

Data Communication – Networks - Protocols and Standards – Network Models – Layers in the OSI model – TCP/IP Protocol Suite – Addressing – Transmission Modes – Transmission Media Telephone Network – Dial-Up Modems – Digital Subscriber Line – Cable TV Networks – Cable TV for Data Transfer.

UNIT - II DATA LINK LAYER 9

Error Detection and Error Correction : Block Coding – Linear Block Codes – Cyclic Codes – Checksum – Data Link Control : Framing – Flow and error control – Protocols – Noiseless channels – Noisy channels – HDLC – Point to point protocols – Wired LANs: Ethernet – IEEE standard - Standard Ethernet – Changes in the standard – Fast Ethernet – Gigabit Ethernet – Wireless LANs: IEEE 802.11 – Bluetooth – SONETISDH – Architecture – SONET layers – SONET frames – STS Multiplexing – SONET networks – Virtual Tributaries.

UNIT - III NETWORK LAYER 9

Internetworking – Ipv4 Addresses – Ipv6 Addresses -Ipv4 – Ipv6 – Transition from IPv4 to IPv6 – Address Mapping –ICMP – IGMP – ICMPv6 – Delivery- Forwarding – Routing – Unicast Routing protocols – Multicast Routing protocols

UNIT - IV TRANSPORT LAYER 9

Process-to-Process Delivery – User Datagram Protocol – TCP – SCTP – Data Traffic – Congestion and its Control – Quality of Service – Improve QoS – Integrated Services – QoS in Switched Networks.

UNIT - V APPLICATION LAYER 9

Domain Name System – Remote Logging – Electronic Mail – File Transfer – WWW and HTTP – Simple Network Management Protocol – Cryptography – Symmetric-Key and Asymmetric-Key Cryptography – Security Service – Message Confidentiality, Integrity and Authentication – IPSec – SSL – PGP – Firewall.

Total Number of Periods: 45

COURSE OUTCOMES :

CO1. To gain the knowledge of OSI Layer, Networks and Protocols Standards.
CO2. To Improve the Concept Wired and Wireless Network in Data Link Layer
CO3. Ability to handle to operation of Network Protocol and Routing
CO4. Analyse the process of Transport Layer
CO5. Design and Develop a basic skill in Application Layer

REFERENCES :

1. Gerry Howser, "Computer Networks and the Internet: A Hands-On Approach", Springer Publication, 2019
2. Oliver C. Ibe, "Fundamentals of Data Communication Networks", Wiley Publication, 2017
3. Behrouz A. Forouzan, "Data Communication and Networking", 4th Edition, McGraw-Hill, 2007.
4. Behrouz A. Forouzan and Firouz Mosharraf, "Computer Networking: A Top-Down Approach", McGraw-Hill, 2013.
5. Andrew S. Tannenbaum and David J. Wetherall, "Computer Networks", Pearson, 2013.
6. William Stallings, "Data and Computer Communications", 8th Edition, Pearson, 2012.
7. Larry L. Peterson & Bruce S. Davie, "Computer Networks – A systems Approach", 5th Edition, 2012.

122CAE03 PROBLEM SOLVING TECHNIQUES

COURSE OBJECTIVES :

- To Understand the Basic Computer Problem Solving
- To Learn and use Factoring Methods
- To gain the knowledge of Array Techniques
- To Understand the fundamental concepts of Text Processing and Pattern Searching
- To design and analysis of dynamic data structures algorithm.

UNIT - I INTRODUCTION TO COMPUTER PROBLEM SOLVING 9

The Problem –Solving Aspect- Top-Down Design – Implementation of Algorithms – Program Verification – The Efficiency of Algorithms – The Analysis of Algorithms – Exchanging the value of two variables – Counting – Summation of a Set of Numbers – Factorial Computation – Sine Function Computation – Generation of Fibonacci Series – Reversing the Digit of an Integer – Base Conversion – Character to Number Conversion.

UNIT - II FACTORING METHODS 9

Introduction – Finding the square root of a Number – The Smallest Divisor of an Integer – The Greatest Common Divisor of Two Integers – Generating Prime Numbers- Computing the Prime Factors of an Integer – Generation of Pseudo –random numbers – Raising a Number to a Large Power – Computing nth Fibonacci number.

UNIT – III ARRAY TECHNIQUES 9

Introduction – Array Order Reversal – Array Counting or Histogramming - Finding the Maximum Number in a Set – Removal of Duplicates from an Ordered Array – Partitioning an Array – Finding the Kth Smallest Elements – Longest Monotone Subsequence.

UNIT - IV TEXT PROCESSING AND PATTERN SEARCHING 9

Introduction – Text Line Length Adjustment – Left and Right Justification of Text – Keyword Searching in Text – Text Line Editing – Linear Pattern Search – Sublinear Pattern Search.

UNIT – V DYNAMIC DATA STRUCTURES ALGORITHMS 9

Stack Operation – Queue Addition and Deletion – Linked List – Binary Tree Traversal – Recursive Quicksort – Towers of Hanoi Problem – Sample Generation – Combination Generation – Permutation Generation.

Total No. of Periods : 45

COURSE OUTCOMES :

CO1 : Able to Choose appropriate computer problem solving to implement to problem definition.
CO2 : Able to manage the Factoring methods
CO3 : Implement Array techniques in the real time applications
CO4 : Design a Text Processing and pattern searching
CO5 : Able to analysis dynamic data structure algorithms.

REFERENCE BOOKS :

1. David a Freitag,"Programming and Problem Solving an Introduction to Computer Science", Independently Published, 2019
2. Maureen Sprankle, Jim Hubbard, "Problem Solving & Programming Concepts", PearsonEducation Limited,2014
3. R.G.Dromey, "How to solve it by Computer", Pearson Education, India, 2009.
4. J.R.Hanly and E.B.Koffman, "Problem Solving and Program Design in C", 5th Edition 2009, Pearson Education.
5. Maureen Sprankle," Problem Solving and Programming Concepts", 7th Edition, Pearson Education 2008.
6. Robert L. Segesta," Concepts of Programming Languages", 10th Ed. Pearson Education, 2012.

122CAE04 DIGITAL FUNDAMENTAL AND COMPUTER ORGANIZATION

COURSE OBJECTIVES :

- To understand the fundamental knowledge about design of digital systems.
- To learn logical operation of digital components and register transfer language.
- To organize and design the basic digital computers.
- To Understand the basic programming and I/O organization
- To Practice knowledge about Memory Organization.

UNIT – I DIGITAL LOGIC CIRCUIT   9

Digital Computers – Logic Gates – Boolean Algebra – Map Simplification – Combinational Circuits: Half –Adder – Full Adder – Flip-Flops: SR Flip-Flop – D Flip –Flop- JK Flip Flop- T-Flip Flop – Sequential Circuit.

UNIT – II DIGITAL COMPONENTS, REGISTER AND MICROOPERATIONS   9

Integrated Circuit – Decoders- Multiplexers- Registers – Shift Registers – Binary Counters – Memory Unit – Register Transfer Language- Bus and Memory Transfer – Arithmetic Micro operations – Logic Micro operations – Shift Micro operations – Arithmetic Logic Shift Unit – Hardware Description Languages.

UNIT III - BASIC COMPUTER ORGANIZATION AND DESIGN   9

Instruction Codes – Computer Registers – Computer Instructions- Timing and Control – Instruction Cycle – Memory- Reference Instructions- Input –output and Interrupt – Complete Computer Description – Design of Basic Computer – Design of Accumulator Logic-.

UNIT IV – BASIC PROGRAMMING AND I/O ORGANIZATION   9

Machine Language – Assembly Language – The Assembler – Program Loops- Subroutines – Input and output programming -. Peripheral Devices – I/O Interface – Asynchronous Data Transfer- Modes of Transfer – Priority Interrupt – Direct Memory Access- I/O Processor – Serial Communications.

UNIT V - MEMORY ORGANIZATION   9

Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory –Memory Management Hardware.

Total No. of Periods : 45

COURSE OUTCOMES :

CO1 : To Gain the knowledge about design of digital systems.
CO2 : Able to perform logical operation of digital component and register transfer language.
CO3 : Implement and organize the basic digital computers
CO4 : Able to write basic programming and I/O Organization
CO5 : Implementation of Memory Organization.

REFERENCE BOOKS :

1. M. Morris Mano, "Computer System Architecture", Third Edition, Pearson Education,2013.
2. Ata Elahi," Computer Systems-Digital Design, Fundamentals of Computer Architecture and Assembly language", Springer Publication, 2017.
3. Joseph D. Dumas, "Computer Architecture –Fundamentals and Principles of Computer Design", CRC Press Publication, 2016
4. Ashok Arora, "Computer Fundamental and Applications", Vikas Publication, 2015.
5. Nikrouz Faroughi, Digital Logic Design and Computer Organization with Computer Architecture for Security, McGraw-Hill Education,2014
6. Sarah Harris, David Harris, Digital Design and Computer Architecture ARM Edition, Elsevier Science, 2015.

122CAE05 ARTIFICIAL INTELLIGENCE

COURSE OBJECTIVES :

- To provide a fundamental concept in Artificial Intelligence.
- To learn how to represent knowledge in solving AI problems
- To apply various techniques in application which involve reasoning.
- To analyse about Natural Language Processing,
- To Explore knowledge about AI applications and Model.

UNIT - I INTRODUCTION 9

Artificial Intelligence Definition-Goal of Artificial Intelligence-AI technique- Progress of AI - Uninformed Search -General State space search- Depth First Search-Depth Limited Search-Iterative Deepening Search-Breadth First Search-Uniform Cost Search-Informed Search-Heuristic Search Techniques-Generate and Test-Best First Search-Hill Climbing

UNIT - II KNOWLEDGE REPRESENTATION 9

Knowledge Representation-Representation and Mappings-Approaches to Knowledge Representation-Propositional Calculus- Predicate Calculus-Clausal Form-Inference Rules-Unification Algorithm-Resolution

UNIT – III SYMBOLIC REASONING UNDER UNCERTAINTY AND STATISTICAL REASONING 9

Non monotonic Reasoning-Bayes Theorem-Certainty Factors-Bayesian Networks-Dempster-Shaffer Theory-Fuzzy Logic—Semantic Nets-Frames-Conceptual Dependency-Scripts-CYC-Game Playing

UNIT - IV NATURAL LANGUAGE PROCESSING, PARALLEL AND DISTRIBUTED ARTIFICIAL INTELLIGENCE 9

Introduction-Syntactic Processing-Semantic Analysis-Discourse and Pragmatic Processing-Stochastic Tools for Language Analysis-Natural Language Applications-Psychological Modeling-Parallelism in Reasoning Systems-Distributed Reasoning Systems-PROLOG

UNIT - V APPLICATIONS 9

AI Applications – Language Models – Information Retrieval – Information Extraction – Natural Language Processing – Machine Translation – Speech Recognition – Robot – Hardware – Perception – Planning – Moving.

Total No. of Periods : 45

COURSE OUTCOMES :

CO1 : Provide a basic exposition to the goals and methods of Artificial Intelligence.
CO2 : Ability to analyse how to represent knowledge in solving AI problems
CO3 : Ability to apply various techniques in application which involve reasoning.
CO4 : Understand Clearly about Natural Language Processing.
CO5 : To Design and Develop an AI Applications.

REFERENCES

1. Elaine Rich and Kevin Knight S.B. Nair, "Artificial Intelligence" Tata McGraw-Hill Pub, Delhi, 2009.
2. M. Tim Jones, "Artificial Intelligence" A systems Approach, Firewall Media, Edition 2010.
3. George F Luger, "Artificial Intelligence, structures and strategies for complex problem solving", Pearson Education, Delhi, Edition 2001
4. Sharbani Bhattacharya," Artificial Intelligence", University Science Press, New Delhi, 2008.
5. S. Russell and P. Norvig, "Artificial Intelligence: A Modern Approach", Prentice Hall, Third Edition, 2009.

122CAL01 DATA STRUCTURES AND ALGORITHMS LAB

COURSE OBJECTIVES :

- To understand the basic operation of linear data structures.
- To learn the concept of non-linear data structures
- To analyse the various sorting techniques.
- To understand the shortest path algorithm.
- To analyse and design various algorithm and techniques.

LIST OF EXPERIMENTS

1. Implement Stack and Queue Operation using Array.

2. Implement Single and Doubly Linked list.

3. Create a Binary Search Tree with traversal.

4. Implement the operation of Binary Search Tree.

5. Sort the given list of numbers using quick sort.

6. Develop program to sort the number using merge sort.

7. Perform Breadth First search in a given graph.

8. Find the Shortest Path Algorithm using Dijkstra Algorithms.

9. Perform Knapsack problem using greedy algorithm

10. Perform Sum of Sub Set Problem using Branch and Bound Method.

Total No. of Periods : 60

COURSE OUTCOMES :

CO1 : Develop a simple algorithm using linear data structures.
CO2 : Implement the concept of nonlinear data structures.
CO3 : Develop an algorithm based on sorting and searching techniques.
CO4 : Implement shortest path algorithm.
CO5 : Design and analysis an application using various algorithms

122CAL02 NETWORK PROGRAMMING LAB

COURSE OBJECTIVES :

- Understands the fundamental concepts of computer networking and OSI Reference model.
- Familiarize the student with the basic taxonomy and terminology of the computer networking area.
- Learn and understand the advanced networking concepts, preparing the student for entry advanced courses in computer networking.
- Develop and gain expertise in some specific areas of networking such as the design and maintenance of individual networks.
- To study about Client-Server models, Processes, Semaphores and their programming.

LIST OF EXPERIMENTS

1. Implement the following forms of IPC.
   a) Pipes
   b) FIFO
2. Implement file transfer using Message Queue form of IPC
3. Write a programme to Create an integer variable using shared memory concept and increment the variable
4. Simultaneously by two Processes. Use Semaphores to avoid race conditions
5. Design TCP iterative Client and Server application to reverse the given input sentence
6. Design TCP Client and Server application to transfer file
7. Design a TCP concurrent Server to convert a given text into uppercase using Multiplexing   system call "select"
8. Design a TCP concurrent Server to echo given set of sentences using poll functions
9. Design UDP Client and Server application to reverse the given input sentence.
10. Design UDP Client server to transfer a file
11. Design using poll Client-Server application to multiplex TCP and UDP requests for converting a given text into upper case.
12. Design a RPC application to add and subtract a given pair of integers.

Total No. of Periods : 60

COURSE OUTCOMES :

CO1 : Identify and understand various techniques and modes of transmission
CO2 : Demonstrate the Data Link Protocols, Multi-Channel access protocols and IEEE 802 standards for LAN
CO3 : Describe routing and congestion in network layer with routing algorithms and classify IPV4 addressing scheme
CO4 : Discuss the elements and protocols of transport layer
CO5 : Develop network security and define various protocols such as FTP, HTTP, Telnet, DNS

122CAL03 APPLIED STATISTICS FOR DATA ANALYSIS LAB

COURSE OBJECTIVES :

- To learn the statistical data representation using frequency distribution and graphical representation of data
- To study about quantitative statistical measures
- To understand the concept of hypothesis
- To understand the data design
- To analysis data based on applied statistics.

LIST OF EXPERIMENTS

1. Program to determine Frequency distribution of data

2. Program to represent the Graphical Representation of data

3. Program to predict the Arithmetic mean, Median and Mode

4. Program to find the variation of coefficient

5. Practice Z-Test and F-Test based on sampling distribution

6. Program to determine Chi-square test.

7. Program to find Karl Pearson's Coefficient of Correlations

8. Program to determine analysis of regressions

9. Program to determine analysis of multivariate

10. Determine the Population of Principal Components

Total No. of Periods : 60

COURSE OUTCOMES:

CO1 : Ability to apply frequency distribution and graphical representation of data.
CO2 : Able to develop the quantitative statistical measures.
CO3 : Knowledge about the concept of hypothesis.
CO4 : Able to develop data design for experiments.
CO5 : Able to develop an analysis of data.

122CAL04 PROBLEM SOLVING TECHNIQUES LAB

COURSE OBJECTIVE :

- To Understand the basic concept of mathematical functions
- To learn various factoring methods
- To gain the knowledge of array with types of dimensions.
- To obtain the knowledge of Text Processing and pattern searching.
- To Practice Recursive algorithms

LIST OF EXPERIMENTS

1. Program to implement number conversion system

2. Program to Compute any Mathematical Functions

3. Program to determine smallest and greatest divisor of an Integer.

4. Program to computing n^{th} Fibonacci Number.

5. Program to remove the duplicate from an ordered array.

6. Finding the Kth Smallest Element from, the given array.

7. Program to search an element using Linear Patten.

8. Program to find the given string is palindrome or not.

9. Implement of Recursive Quicksort.

10. Program to manipulate Tower of Hanoi Problem.

Total No. of Periods : 60

COURSE OUTCOMES :

CO1 : Able to design mathematical functions.
CO2 : Implement the Concept of Factoring methods.
CO3 : Develop a program using array with types of dimensions.
CO4 : Design and develop text processing and pattern searching.
CO5 : To Implement Recursive algorithms.

122CAL05 PYTHON PROGRAMMING LAB

COURSE OBJECTIVES :

- To Understand the fundamental concepts of statements and functions
- To enable the knowledge Python data structure and Standard Libraries
- To Perform File operation and Exception handling.
- To implement Inheritance and Integration with Database
- To develop a program with packages and frameworks.

LIST OF EXPERIMENTS

1. Write a python program to implement conditional and branching statements.

2. Design a user defined function and recursive functions.

3. Write a simple program using List, Tuples and Dictionary.

4. Python program to develop functions using standard libraries

5. Write a program to manipulate the various file operations.

6. Python program to implement exception handling

7. Develop a python program using Inheritance.

8. Integrate Web Application in python using MySQL Database.

9. Write a program to make your own module.

10. Design a program to visualize the data using python libraries

Total No. of Periods : 60

COURSE OUTCOMES :

CO1 : Develop a simple application using statement and functions.
CO2 : Implement the concept of python data structures with standard libraries.
CO3 : Develop an application of exception handling with file operations.
CO4 : Implement Web Application using MySQL Database.
CO5 : Design and develop an application using Packages and frameworks.

BRIDGE COURSE

122CAB01 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING -I

COURSE OBJECTIVES :

- To enable the student to learn the major components of a computer system.
- To know the correct and efficient ways of solving problems
- To learn to basic operating systems concept with internet applications
- To learn to program in C.
- To explore functions and pointer in C

MODULE – I INTRODUCTION TO COMPUTERS

Introduction – Characteristics of Computer – Evolution of Computer – Computer Generation – Classification of Computers – Basic Computer Organization – Number Systems.

MODULE – II PROBLEM SOLVING AND OFFICE APPLICATION SOFTWARE

Planning the Computer Program – Purpose – Algorithm – Flow Charts – Pseudocode – Application Software Packages – Introduction to Office Packages - Getting Connected to Internet Applications.

MODULE – III OPERATING SYSTEMS

Getting Connected to Internet Applications- Operating System Components – System Services – System calls – System Programs – Process Concepts – Process Scheduling – Operation on Process- Cooperation Process – Inter Process communications – CPU Scheduling and Criteria – Scheduling algorithm.

MODULE – IV INTRODUCTION TO C PROGRAMMING

Overview of C Programming – Constants, Variable and Data Types – Operators and Expression – Managing Input and Output Operators – Decision Making - Branching and Looping.

MODULE –V FUNCTIONS AND POINTERS

Handling of Character String – User Defined Functions – Definition – Declarations – Call by Reference – Call by Value- Structure and Unions – Pointers - Arrays – The Preprocessor – Developing C Program

Total Number of Hours : 45

COURSE OUTCOMES :

CO1 : Non Computer Science Student Can Understand the components of Computers
CO2 : To Gain knowledge of Problem Solving with packages.
CO3 : Ability to Understand Operating System
CO4 : Basic knowledge to write a simple programmes in c
CO5 : Understand Functions and pointers.

REFERENCES :

1. Herbert Schildt, "C: The Complete Reference",4th Edn., 2017
2. Pradip Dey, Manas Ghoush, "Programming in C", Oxford University Press. (2007).
3. Byron Gottfried, "Programming with C", 2 nd Edition, (Indian Adapted Edition), TMH publications, (2006).
4. Stephen G.Kochan, "Programming in C", Third Edition, Pearson Education India, (2005).
5. Brian W.Kernighan and Dennis M.Ritchie, "The C Programming Language", Pearson Education Inc., (2005).
6. E.Balagurusamy, "Computing fundamentals and C Programming", Tata McGraw-Hill Publishing Company Limited, (2008).
7. S.Thamarai Selvi and R.Murugan, "C for All", Anuradha Publishers, (2008).
8. Abhraham Silberschatz, Greg Gagne, Peter B Galvin,"Operating System Concepts", Eight Edition, Wiley Publication 2019.

122CBP01 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING LAB – I

COURSE OBJECTIVES :

- To make the student learn a programming language.
- To learn problem solving techniques.
- To write programmes in C and to solve the problems.

LIST OF EXPERIMENTS

1. Implement arithmetic operators using C.

2. Implement Looping Statements using C

3. Implement Conditional Statements using C.

4. Implement Arrays using C.

5. Implement Functions in C.

6. Implement Structure and Union in C.

7. Implement Pointers in C.

COURSE OUTCOMES :

CO1: Read, understand and trace the execution of programs written in C language.
CO2: Design the Looping and Conditional Statements.
CO3: Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
CO4: Develop a simple program using Structure and Union in C
CO5: Design the operations using derived data types.

122CAE06 - CONSTITUTION OF INDIA

COURSE OBJECTIVES :

- Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
- To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional.
- Role and entitlement to civil and economic rights as well as the emergence nation hood in the early years of Indian nationalism.
- To address the role of socialism in India after the commencement of the Bolshevik Revolutionin1917and its impact on the initial drafting of the Indian Constitution.
- To understand the functioning of Union, State and Local Governments in Indian federal system.

UNIT - I HISTORY OF MAKING OF THE INDIAN CONSTITUTION   **5**

History, Drafting Committee, (Composition & Working)

UNIT - II PHILOSOPHY OF THE INDIAN CONSTITUTION   **5**

Preamble, Salient Features

UNIT - III CONTOURS OF CONSTITUTIONAL RIGHTS AND DUTIES   **5**

Fundamental Rights, Right to Equality, Right to Freedom, Right against Exploitation, Right to Freedom of Religion, Cultural and Educational Rights, Right to Constitutional Remedies, Directive Principles of State Policy, Fundamental Duties.

UNIT - IV ORGANS OF GOVERNANCE   **5**

Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions.

UNIT - V LOCAL ADMINISTRATION   **5**

District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO, Municipal Corporation. Pachayati raj: Introduction, PRI: ZilaPachayat. Elected officials and their roles, CEO Zila Pachayat: Position and role. Block level: Organizational Hierarchy(Different departments), Village level:Role of Elected and Appointed officials, Importance of grass root democracy.

UNIT - VI ELECTION COMMISSION   **5**

Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners - Institute and Bodies for the welfare of SC/ST/OBC and women.

Total Number of Hours : 30

COURSE OUTCOMES :

CO1 : Discuss the significance of Indian Constitution as the fundamental law of the land.
CO2 : Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
CO3 : Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
CO4 : Discuss the circumstances surrounding the foundation of the Congress Socialist Party[CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.
CO5 : Discuss the passage of the Hindu Code Bill of 1956.

REFERENCES :

1. The Constitution of India,1950(Bare Act), Government Publication.
2. Dr.S.N.Busi, Dr.B. R.Ambedkar framing of Indian Constitution,1st Edition,2015.
3. M.P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis,2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

122CAE07 - DISASTER MANAGEMENT

COURSE OBJECTIVES :

- Summarize basics of disaster
- Explain a critical understanding of key concepts in disaster risk reduction and humanitarian response.
- Illustrate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
- Describe an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
- Develop the strengths and weaknesses of disaster management approaches

UNIT - I INTRODUCTION 6

Disaster: Definition, Factors and Significance; Difference between Hazard and Disaster; Natural and Manmade Disasters: Difference, Nature, Types and Magnitude.

UNIT - II REPERCUSSIONS OF DISASTERS AND HAZARDS 6

Economic Damage, Loss of Human and Animal Life, Destruction of Ecosystem. Natural Disasters: Earthquakes, Volcanisms, Cyclones, Tsunamis, Floods, Droughts and Famines, Landslides and Avalanches, Man-made disaster: Nuclear Reactor Meltdown, Industrial Accidents, Oil Slicks and Spills, Outbreaks of Disease and Epidemics, War and Conflicts.

UNIT - III DISASTER PRONE AREAS IN INDIA 6

Study of Seismic Zones; Areas Prone to Floods and Droughts, Landslides and Avalanches; Areas Prone to Cyclonic and Coastal Hazards with Special Reference to Tsunami; Post-Disaster Diseases and Epidemics

UNIT - IV DISASTER PREPAREDNESS AND MANAGEMENT 6

Preparedness: Monitoring of Phenomena Triggering a Disaster or Hazard; Evaluation of Risk: Application of Remote Sensing, Data from Meteorological and Other Agencies, Media Reports: Governmental and Community Preparedness.

UNIT - V RISK ASSESSMENT 6

Disaster Risk: Concept and Elements, Disaster Risk Reduction, Global and National Disaster Risk Situation. Techniques of Risk Assessment, Global Co-Operation in Risk Assessment and Warning, People's Participation in Risk Assessment. Strategies for Survival

Total Number of Hours : 30

COURSE OUTCOMES :

CO1 : Ability to summarize basics of disaster

CO2 : Ability to explain a critical understanding of key concepts in disaster risk reduction and humanitarian response.

CO3 : Ability to illustrate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.

CO4 : Ability to describe an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.

CO5 : Ability to develop the strengths and weaknesses of disaster management approaches.

REFERENCES :

1. Goel S. L., Disaster Administration And Management Text And Case Studies",Deep & Deep Publication Pvt. Ltd., New Delhi,2009.
2. NishithaRai, Singh AK, "Disaster Management in India: Perspectives, issues and strategies", NewRoyal book Company,2007.
3. Sahni, PardeepEt.Al. ," Disaster Mitigation Experiences And Reflections", Prentice Hall of India, New Delhi,2001.

222CAT01 - ADVANCED JAVA PROGRAMMING

COURSE OBJECTIVES:

- Basic Concept of Core Java.
- Practice Exception Handling and Multithreading
- Provide Knowledge about Client-Side Scripting
- Analysing the functionalities of Server-Side Scripting
- Understand the prototypes of spring.

UNIT –I   CORE JAVA   9

Java Features – Java Platform – Java Fundamental – Expression – Operators – Control Structures – Classes and Object – Inheritance – Polymorphism – Abstract Class – Interface – Packages.

UNIT-II   EXCEPTIONAL HANDLING   9

Exception Handling Fundamentals – Exception Types – Java Built-in Exception – Creating Your Own Exception Subclasses – Chained Exception – The Java Thread Model – Thread Priorities- Creating Thread: Implementing Runnable Interface – Synchronization – Inter thread communications.

UNIT – III   JAVASCIRPT   9

JavaScript Prototypes – Object Oriented Programming – Class – Modules - Functions Expression – DOM – Events - HTML5 Scripting – JSON – AJAX – Comet.

UNIT – IV   SERVER-SIDE PROGRAMMING   9

Web Server: Web Container – Web Components, Servlet: Life Cycle – Request – Servlet Context – Response – Filter – Session – Dispatching Requests – Web Socket – Logging – Log4J2 -Build tool – Gradle.

UNIT – V   SPRING   9

Introduction to Spring – Architecture – IoC Container – Bean Definition – Scopes – Life Cycle – Dependency Injection – Annotation – Controller – View – Input Validation – File Upload – Container – Logging with Log4J.

Total No. of Periods: 45

COURSE OUTCOMES:

CO1 : To apply the basic knowledge of Core Java
CO2 : To implement Exception handling and multithreading in applications
CO3 : Able to Design Client-side scripting.
CO4 : Develop and design a Server-Side scripting
CO5 : Create an application with IoC Container.

REFERENCES

1. Herbert Schildt, "The Java Complete Reference", 12th Edition, Tata McGraw Hill, 2021.
2. Mark Heckler, "Spring boot in Action", O'Reilly Publications, 2021
3. Alex Banks, Eve Porcello, "Learning React", O'Reilly Media, Inc, 2nd Edition, 2020
4. E. Balaguruswamy, "Programming with JAVA", 6th Edition, Tata McGraw Hill, 2019.
5. Nicholas C. Zakas, "Professional JavaScript for Web Developers", 3rd Edition Wrox Publication 2018.
6. David R. Heffelfinger, "Java EE 8 Application Development", Packt Publishing, First edition2017
7. Benjamin Muschko, "Gradle in Action", Manning Publications, First edition2014
8. Iuliana Cosmina, Rob Harrop, Chris Schaefer, Clarence Ho, "Pro Spring 5: An In-Depth Guide to the Spring Framework and Its Tools", Apress, Fifth edition2017

220CAT02 - DATA MINING AND DATA WAREHOUSING

COURSE OBJECTIVES:

- To expose the concepts of Data Warehousing Architecture and Implementation.
- To learn the association rule mining for handling large data.
- To understand the concept of classification for the retrieval purposes.
- To identify Business applications and Trends of Data mining.

UNIT – I DATA MINING AND DATA PREPROCESSING   **9**

Data Mining Concepts, KDD vs Data mining - DBMS vs Data mining - Data Mining Techniques - Issues and Challenges - Steps in Data Mining Process - Architecture of a Typical Data Mining Systems - Data Mining Application Areas - Data Pre-processing: Pre-process the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation - Case Studies: Data Mining Applications

UNIT – II MINING ASSOCIATION RULE   **9**

Mining Association Rules: The Naïve Algorithm for Finding Association Rules- Apriori Algorithm - Partition Algorithm- FPTree Growth Algorithm - Discussion on Different Algorithms - Incremental Algorithm - Border Algorithm - Association Rules with Item Constraints.

UNIT – III CLASSIFICATION AND PREDICTION   **9**

Classification by Decision Tree - Bayesian Classification- Bayesian Belief Networks - Rule Based Classification - Classification by Backpropagation - Support Vector Machines - K-Nearest Neighbor Algorithm - Prediction

UNIT – IV CLUSTER ANALYSIS AND DATA MINING APPLICATIONS   **9**

Clustering - Requirement for Cluster Analysis, Clustering Methods - Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Evaluation of Clustering. Applications of Data Mining: Applications of Data Mining - Social Impacts of Data Mining - Spatial data mining - Text mining

UNIT – V DATA WAREHOUSING AND OLAP   **9**

Data Warehousing Components - Multi Dimensional Data Model - Data Warehouse Architecture - Data Warehouse Implementation - Mapping the Data Warehouse Architecture to Multiprocessor Architecture - Introduction to OLAP - Need for OLAP Operations - Categorization of OLAP Tools.

Total No. of Periods: 45

COURSE OUTCOMES:

CO1: Able to Analyze role of data mining and data pre-processing.
CO2: Demonstrate the functionalities of Mining Association Rule.
CO3: Gain the Knowledge in Classification and Prediction Algorithm.
CO4: Analyze the cluster and develop application based on data mining.
CO5: Able to understand the basic concept of Data Warehousing and OLAP

REFERENCES

1. Parteek Bhatia, "Data Mining and Data Warehousing Principles and Practical Techniques", Cambridge Publication, 2019.
2. Arun K.Pujari,"Data Mining Techniques", University Press, 3rd Edition ,2013.
3. Dunham Margaret H, "Data Mining: Introductory and Advanced Topics", Pearson Education, Inc., 2012.
4. Jiawei Han, MichelineKamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann Publishers, 3rd Edition, 2011.
5. Alex Berson, Stephen J. Smith, "Data Warehousing, Data Mining & OLAP", Tata McGraw - Hill Edition,2011.
6. David Hand, Heikki Mannila, Padharic Symth," Principles of Data Mining", PHI, 2009.
7. Sean Kelly, "Data Warehousing in Action", John Wiley & Sons Inc, 2007.

222CAT03 - FULL STACK WEB DEVELOPMENT

COURSE OBJECTIVES:
- To Understand the fundamental concept of PHP,Array and PHP Functions.
- To build an application with database and cookies.
- To Construct the Web Page using PHP Framework.
- To learn server side development using NodeJS.and architect databases using NoSQL and SQL databases.
- To learn the advanced client side scripting and ReactJS framework

UNIT I   INTRODUCTION   **9**

Getting PHP - Frameworks Introduction – Types of Frame works –Creating a First PHP Page- Understanding PHP's Internal Data types- PHP Array Functions Creating function in PHP – Introduction to Variable Scope in PHP – Nesting Functions.-Handling Form Controls.

UNIT II   WORKING WITH DATABASES AND COOKIES   **9**

Database Introduction – Creating MYSQL Database - Accessing database in PHP – Updating Databases – Inserting item into a Database – Delete Records. Setting a Cookie – Reading a Cookie – Session – Working with FTP – Downloading Files with FTP – Deleting a File with FTP.

UNIT III   SERVER SIDE PROGRAMMING WITH NODE JS   **9**

Introduction to Web Servers – Javascript in the Desktop with NodeJS – NPM – Serving files with the http module – Introduction to the Express framework – Server-side rendering with Templating Engines – Static Files - async/await - Fetching JSON from Express

UNIT IV   ADVANCED NODE JS AND DATABASE   **9**

Introduction to NoSQL databases – MongoDB system overview - Basic querying with MongoDB shell – Request body parsing in Express – NodeJS MongoDB connection – Adding and retrieving data to MongoDB from NodeJS – Handling SQL databases from NodeJS – Handling Cookies in NodeJS – Handling User Authentication with NodeJS

UNIT V   ADVANCED CLIENT SIDE PROGRAMMING   **9**

React JS: React DOM - JSX - Components - Properties – Fetch API - State and Lifecycle - JS Local storage - Events - Lifting State Up - Composition and Inheritance

Total No. of Periods: 45

COURSE OUTCOMES:

CO1 : Ability to understand the fundamental concept of PHP,Array and Functions
CO2 : Work with database and cookies for real time applications,
CO3 : Design and develop applications using advanced frameworks.
CO4 : Implement and architect the server side of the web application using NodeJS.
CO5 : Architect NoSQL databases with MongoDB.

REFERENCES:

1. Paul Zikopoulos, Christopher Bienko, Chris Backer, Chris Konarski, Sai Vennam, Cloud Without Compromise", O'Reilly Media, 1st edition, 2021
2. Paul Gibbs, PHP Tutorials-Programming With PHP and Mysql, Revised and Updated ,5th Edition, Dec 2020 .
3. Kevin Tatore, Peter MacIntyre and Rasmus Lerdorf, Programming PHP, O'Reilly, 2015.
4. Steven Holzner, PHP The Completer Reference, McGraw Hill Education, reprint 2013.
5. David Sklar and Adam Tracktenberg, PHP Cookbook, Oreilly, 2nd Edition,2010.
6. David Flanagan, "Java Script: The Definitive Guide", O'Reilly Media, Inc, 7th Edition, 2020
7. Alex Banks, Eve Porcello, "Learning React", O'Reilly Media, Inc, 2nd Edition, 2020
8. Matt Frisbie, "Professional JavaScript for Web Developers", Wiley Publishing, Inc,4th Edition, ISBN: 978-1-119-36656-0, 2019

222CAT04 - CLOUD COMPUTING

COURSE OBJECTIVES:

- To Understand the fundamentals of cloud computing.
- To Learn the basics of cloud computing
- To Understand the functionalities of Cloud infrastructure
- Expose Knowledge of cloud computing technologies.
- Learn about the security used in cloud computing

UNIT-I FUNDAMENTALS OF CLOUD COMPUTING   9

Introduction to Distributed Systems – Characterization of Distributed Systems – Distributed Architectural Models – Remote Invocation – Request – Reply Protocol – Remote Procedure Call – Remote Method Invocation – Group Communication – Coordination in Group Communication – Ordered Multicast – Time Ordering – Physical Clock Synchronization – Logical Time and Logical Clocks.

UNIT – II   BASICS OF CLOUD COMPUTING   9

Cloud Computing Basics- Desired Features of Cloud Computing- Elasticity in Cloud- On-Demand Provisioning – Applications – Benefits – Cloud Components: Clients, Data centers & Distributed Servers – Principles of Parallel and Distributed Computing – Application of Cloud Computing – Benefits – Cloud Services – Open-Source Cloud Software: Eucalyptus, Open Nebula, Open Stack, Cloudsim.

UNIT – III CLOUD INFRASTRUCTURE   9

Cloud Architecture and Design – Architecture Design Challenges - Technologies for Network-Based System – NIST – Cloud Computing Reference Architecture – Public, Private, and Hybrid Clouds – Cloud Models: IaaS, PaaS, and SaaS – Cloud Storage providers – Enabling Technologies for the Internet of Things – Innovative Application of Internet of Things.

UNIT – IV CLOUD ENABLING TECHNOLOGIES   9

Service Oriented Architecture – Web Services – Basics of Virtualization – Emulation – Types of Virtualization – Implementation Levels of Virtualization – Virtualization Structures – Tools and Mechanisms – Virtualization of CPU, Memory, and I/O Devices – Desktop Virtualization – Server Virtualization – Google App Engine – Amazon AWS – Federation in cloud.

UNIT – V SECURITY IN CLOUD   9

Security Overview – Cloud Security Challenges and Risks – Software as Service Security – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security – Identity Management and Access Control – Autonomic Security.

Total No. of Periods: 45

COURSE OUTCOMES:

CO1 : Able to understand the basic concept of Distributed computing.
CO2 : Ideas about basics of Cloud computing
CO3 : Gain the Knowledge about Cloud Infrastructure
CO4 : Ability to utilize the cloud-enabling technologies
CO5 : Develop security and standards in the cloud.

REFERENCES:

1. Douglas Comer, "The cloud Computing: The Future of Computing", CRS Publication, 2021.
2. Sandeep Bowmik, "The Cloud Computing", Cambridge University, 2017.
3. Kai Hwang, Geoffrey C. Fox & Jack J Dongarra, "Distributed and Cloud Computing From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, First Edition, 2012.
4. Andrew S. Tanenbaum & Maarten Van Steen, "Distributed System – Principles and Paradigm", Third Edition, Pearson, 2017.
5. Thomas Erl, Zaigham Mahood and Ricardo Puttini, "Cloud Computing, Concept, Technology and Architecture", Prentice Hall, Second Edition, 2013.

222CAP01- ADVANCED JAVA PROGRAMMING LAB

COURSE OBJECTIVES:

- Understand the prototypes of Java Programming
- Practice Interface, Abstract, and Multithreading.
- Gain knowledge in Client-Side Scripting
- Understand Prototypes of Server-Side Scripting.
- Knowledge about Spring.

LIST OF EXPERIMENTS

1. Practice Control Structures and Loop through Simple Program

2. Program to implement abstract and interface.

3. Program to implement Exception Handling.

4. Practice a program with the Multithreading concept.

5. Develop a function using DOM

6. Design and develop a simple scripting application using JSON.

7. Implement a simple server-side application using servlet.

8. Design and develop server scripting using Web Socket.

9. Develop a simple application using Spring with Dependency Injection.

10. Develop an application with input validation using Spring.

Total No. of Periods: 60

COURSE OUTCOMES:

CO1. Able to know the prototypes in Java
CO2. Able to practice Interface, Abstract, and multithreading.
CO3. Develop a Client-Side Scripting.
CO4. Design and develop a server-side scripting.
CO5. Deploy an application using Spring.

222CAE01- MACHINE LEARNING TECHNIQUES

COURSE OBJECTIVES:

- To study the basics of machine learning
- To learn linear models
- To understand distance based clustering techniques
- To know about tree and rule based models
- To understand ensemble learning

UNIT-I   INTRODUCTION   9

Machine learning - Task: problems solved with machine learning, Looking for structure, Performance evaluation - Models: Geometric models, Probabilistic models, Logical models, Grouping and grading –Features – Binary Classification: Classification, Scoring and ranking, Class probability estimation - Handling more than two classes - Regression-Movie genre identification and rating system.

UNIT-II   LINEAR MODELS   9

Concepts: Supervised, Unsupervised and Descriptive learning - Hypothesis space - Linear classification – univariate linear regression - multivariate linear regression - logistic regression - perceptron - multilayer neural networks - learning neural networks structures - support vector machines- Credit card approval system

UNIT III   DISTANCE-BASED MODELS   9

Distance and measure - Neighbours and exemplars - Nearest neighbour classification - Distance based clustering: Kmeans algorithm, clustering around medoids - clustering using kernels - silhouettes - hierarchical clustering - Document clustering

UNIT-IV   TREE AND RULE MODELS   9

Decision trees - learning decision trees - ranking and probability estimation trees - regression trees -clustering trees - learning ordered rule lists - learning unordered rule lists - descriptive rule learning - first- order rule learning- spam filtering

UNIT-V   MODEL ENSEMBLES   9

Features: Kinds of feature, Feature transformation, Feature Construction and Selection - Ensemble learning: bagging and random forests - Boosting: Boosted rule learning - Mapping the ensemble landscape: Bias, variance, margin, other ensemble methods - Meta learning -Diabetes diagnosis system.

Total No. of Periods: 45

COURSE OUTCOMES:

CO1 : Understand the concepts of machine learning
CO2 : Apply the linear modelling techniques to solve a problem
CO3 : Understand distance based clustering techniques
CO4 : Design tree and rule based models
CO5 : Apply ensemble learning techniques

REFERENCES:

1. Manaranjan Pradhan and Dinesh Kumar U., "Machine Learning using Python", Wiley India Pvt. Ltd., 2019.
2. Brink Henrik, Richards Joseph W & Fetherolf Mark, "Real-World Machine Learning", 2nd Edition, Dreamtech Press, 2017
3. K. P. Murphy, "Machine Learning: A probabilistic perspective", MIT Press, 2012.
4. C. M. Bishop, "Pattern Recognition and Machine Learning", Springer, 2007.
5. M. Mohri, A. Rostamizadeh, and A. Talwalkar, "Foundations of Machine Learning", MIT Press, 2012.
6. P. Flach, "Machine Learning: The art and science of algorithms that make sense of data", Cambridge University Press, 2012

222CAE02- INTERNET OF THINGS

COURSE OBJECTIVES:

- Explain the concept of loT.
- Analyze various protocols for loT.
- Design a Poe of an Io'T system using Raspberry Pi/Arduino
- Apply data analytics and use cloud offerings related to loT.
- Analyze applications of loT in real-time scenario

UNIT I FUNDAMENTALS OF loT 9

Evolution of Internet of Things - Enabling Technologies - loT Architectures: oneM2M, loT World Forum (loTWF) and Alternative loT models - Simplified loT Architecture and Core loT Functional Stack - Fog, Edge , and Cloud in loT - Functional blocks of a loT ecosystem - Sensors, Actuators, Smart Objects and Connecting Smart Objects.

UNIT II loT PROTOCOLS 9

loT Access Technologies: Physical and MAC layers, topology and Security of IEEE 802.15.4, 802.15.4g, 802.15.4e, 1901.2a, 802.11 ah and LoRaWAN - Network Layer: IP versions, Constrained Nodes and Constrained Networks - Optimizing IP for loT: From 6LoWPAN to 6Lo, Routing over Low Power and Lossy Networks - Application Transport Methods: Supervisory Control and Data Acquisition - Application Layer Protocols: CoAP and MQTT.

UNIT III DESIGN AND DEVELOPMENT 9

Design Methodology - Embedded computing logic - Microcontroller, System on Chips - loT system building blocks - Arduino - Board details, IDE programming - Raspberry Pi - Interfaces and Raspberry Pi with Python Programming.

UNIT IV DATA ANALYTICS AND SUPPORTING SERVICES 9

Structured Vs Unstructured Data and Data in Motion Vs Data in Rest - Role of Machine Learning - No SQL Databases - Hadoop Ecosystem - Apache Kafka, Apache Spark - Edge Streaming Analytics and Network Analytics - Xively Cloud for loT, Python Web Application Framework - Django -AWS for loT - System Management with NETGONF-YANG.

UNIT V INDUSTRIAL APPLICATIONS 9

Cisco loT system - IBM Watson loT platform - Manufacturing - Converged Plantwide Ethernet Model (CPwE) - Power Utility Industry – Grid Blocks Reference Model - Smart and Connected Cities: Layered architecture, Smart Lighting, Smart Parking Architecture and Smart Traffic Control.

Total No. of Periods: 45

COURSE OUTCOMES:

CO1 : To introduce the fundamentals, evolution, architecture and sensors of IOT.
CO2 : To provide the protocols of IOT.
CO3 : To provide the Design and Development of IOT system using computing Logic.
CO4 : To give the Data Analytics and supporting services for IOT system.
CO5 : To present the case studies and Implementation of IOT system

REFERENCES:

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete. Rob Barton and Jerome Henry, "loT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, Cisco Press, 2020
2. Arshdeep Bahga, Vijay Madisetti, ―Internet of Things – A hands-on approach‖, Universities Press, 2017
3. Olivier Hersent, David Boswarthick, Omar Elloumi, ―The Internet of Things – Key applications and Protocols‖, Wiley, 2015
4. Jan Ho¨ ller, Vlasios Tsiatsis, Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle, "From Machine-to-Machine to the Internet of Things - Introduction to a New Age of Intelligence", Elsevier, 2014.
5. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), ―Architecting the Internet of Things‖, Springer, 2011.
6. Michael Margolis, Arduino Cookbook, Recipes to Begin, Expand, and Enhance your projects, 2nd Edition, O'Reilly_Media,_2011.

222CAE03 – BLOCK CHAIN TECHNOLOGY

COURSE OBJECTIVES:
- Understand the fundamental concept of Block chain.
- Practice BITCOIN and Cryptocurrency
- To enable BITCOIN and distributed consensus
- To apply of Block chain Application

UNIT – I INTRODUCTION TO BLOCK CHAIN   9

Block chain- Public Ledgers, Block chain as Public Ledgers -Bitcoin, Block chain 2.0, Smart Contracts, Block in a Block chain, Transactions-Distributed Consensus, The Chain and the Longest Chain - Cryptocurrency to Block chain 2.0 - Permissioned Model of Block chain, Benefits and limitations of blockchain-Features of a blockchain.

UNIT – II BITCOIN AND CRYPTOCURRENCY   9

A basic crypto currency, Creation of coins, Payments and double spending, FORTH – the precursor for Bitcoin scripting, Bitcoin Scripts, Bitcoin P2P Network, Transaction in Bitcoin Network, Block Mining, Block propagation and block relay, Consensus introduction, Distributed consensus in open Environments-Consensus in a Bitcoin network.

UNIT – III BITCOIN CONSENSUS   9

Bitcoin Consensus, Proof of Work (PoW)- Hash cash PoW, Bitcoin PoW, Attacks on PoW ,monopoly problem- Proof of Storage, Proof of Stake- Proof of Burn-Proof of Activity (PoA) Proof of Elapsed Time - Bitcoin Miner, Mining Difficulty, Mining Pool-Permissioned model and use cases, Design issues for Permissioned Block chains, Execute contracts- Consensus models for permissioned block chain-Distributed consensus in closed environment Paxos.

UNIT – IV DISTRIBUTED CONSENSUS   9

RAFT Consensus-Byzantine general problem, Byzantine fault tolerant system Agreement Protocol, Lamport-Shostak-Pease BFT Algorithm-BFT over Asynchronous systems, Practical Byzantine Fault Tolerance

UNIT –V ETHERUM   9

Ethereum network, EVM, Transaction fee, Mist Browser, Ether, Gas, Solidity, Smart contracts, TruffleDesign and issue Crypto currency, Mining, DApps-Requirements and operation of DApps, DAO.

Total No. of Periods: 45

COURSE OUTCOMES:

CO1 : Understand emerging abstracts models for Block chain technology.
CO2 : Identify major research challenges and technical gaps existing between theory and practice in crypto currency domain
CO3 : Provide a conceptual understanding of Block chain function
CO4 : Apply Hyper Ledge Fabric and Etheric platform to implement the block chain application
CO5 : Develop a simple Block chain Application

REFERENCES:

1. Chandramouli Subramanian, Block chain Technology, Universities Press (India) Pvt. Ltd., First edition 19 August 2020.
2. Kim, Shiho, and Ganesh Chandra Deka, eds. Advanced applications of block chain technology. Springer, 2020.
3. Mastering Block chain: Deeper insights into decentralization, cryptography, Bitcoin, and popular Block chain frameworks by Bashir, Imran,2017.
4. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press, 2016.
5. Joseph Bonneau et al, SoK: Research perspectives and challenges for Bitcoin and cryptocurrency, IEEE Symposium on security and Privacy, 2015.
6. Bashir, Imran. Mastering block chain. Packt Publishing Ltd, 2017.

222CAE04 - MOBILE COMPUTING

COURSE OBJECTIVES:

- Understand the basic concepts of mobile computing.
- Be familiar with the network protocol stack.
- Be exposed to Ad-Hoc networks.
- Gain knowledge about different mobile platforms and application development.

UNIT - I   INTRODUCTION   9

Mobile Computing – Mobile Computing Vs wireless Networking – Mobile Computing Architecture - Mobile Computing Applications – Characteristics of Mobile computing – Structure of Mobile Computing Application. MAC Protocols – Wireless MAC Issues – Fixed Assignment Schemes – Random Assignment Schemes – Reservation Based Schemes.

UNIT - II   MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER   9

Overview of Mobile IP – Features of Mobile IP – Key Mechanism in Mobile IP – route Optimization– Dynamic Host Configuration Protocol (DHCP). Overview of TCP/IP – Architecture of TCP/IP- Adaptation of TCP Window – Improvement in TCP Performance.

UNIT - III   MOBILE TELECOMMUNICATION SYSTEM   9

Cellular Mobile Communication – Global System for Mobile Communication (GSM) – General Packet Radio Service (GPRS) – Universal Mobile Telecommunication System (UMTS).

UNIT - IV   MOBILE AD-HOC NETWORKS   9

Ad-Hoc Basic Concepts – Characteristics – Applications – Design Issues – Routing – Essential of Traditional Routing Protocols –Popular Routing Protocols – Vehicular Ad Hoc networks (VANET) – MANET Vs VANET – Security–Attacks on Ad-Hoc network–Security Attack Countermeasures.

UNIT – V   MOBILE PLATFORMS AND APPLICATIONS   9

Mobile Device Operating Systems – Special Constrains & Requirements – Commercial Mobile Operating Systems – Software Development Kit: iOS, Android, BlackBerry, Windows Phone - Applications of M-Commerce – B2B – Structure – Pros & Cons – Mobile Payment System – Security Issues.

Total No. of Periods: 45

COURSE OUTCOMES:

CO1: Understand the basics of mobile computing.

CO2: Understand the functionality of each layer.

CO3: Gain the knowledge of mobile internet protocol

CO4: Acquired the knowledge to use simulator tools and design Ad hoc networks.
CO5: Able to develop mobile application.

REFERENCES:

1. Tarkeshwar Barua, Ruchi Doshi, Kamal Kant Hiran ,Mobile Applications Development ,2020
2. Mutamed Khatib and Nael Salman,"Mobile Computing" Intech Open Publication, 2018.
3. Prasant Kumar Pattnaik, Rajib Mall, "Fundamentals of Mobile Computing", PHI Learning Pvt. Ltd, New Delhi – 2012.
4. Raj Kamal, "Mobile Computing", Second Edition, Oxford University Press,May 2019.
5. Himanshu Dwivedi, Chris Clark, David Thiel, "Mobile Application Security", Tata McGraw-Hill, 2016.
6. Wei-Meng Lee, "Beginning Andriod Application Development", Wiley India Pvt. Ltd, 2011.
7. Jochen H. Schiller, "Mobile Communications", Second Edition, Pearson Education, 2009.

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222CAE05 - C# AND DOT NET PROGRAMMING

COURSE OBJECTIVES:

- Understanding of .Net Programming with fundamental concepts
- Learn the objected oriented aspects of C#
- To learn the technologies of the .NET framework.
- To develop web based application development .NET
- To update and enhance skills in writing Windows applications, ADO.NET and ASP .NET

UNIT - I C#   LANGUAGE FUNDAMENTALS   9

The Building Block of the .NET Platform (CLR,CTS, and CLS) – Overview of Assemblies - The Anatomy of a Simple C# Program - Defining Classes and Creating Objects - The System Console Class-Establishing Member Visibility - Default Values of Class Member Variables-Member Variable Initialization Syntax- Static Keyword - Method Parameter Modifiers - Iteration Constructs - Decision Constructs and the Relational / Equality Operators - Understanding Value Types and Reference Types-Boxing and Unboxing - Working with .NET Enumerations - Overriding Some Default Behaviors of System. Object - The System Data Types - String Data Type - .NET Array Types - Custom Namespaces.

UNIT - II   OBJECT ORIENTED PROGRAMMING WITH C#   9

Understanding the C# Class Type - Reviewing the Pillars of OOP - The First Pillars: C#'s Encapsulation Services, The Second Pillar: C#'s Inheritance Support - Programming for Containment/Delegation - The Third Pillar: C#'s Polymorphic Support-C# Casting Rules - Understanding Object Lifetime - Basics of Object Lifetime - Role of Application Roots - Garbage Collection - Building Finalizable and Disposable Types. Exception Handling - Throwing a Generic Exception - Catching Exceptions.

UNIT - III   C# ADVANCED FEATURES   9

Defining Interfaces in C#-Implementing an Interface in C# - Contrasting Interfaces to Abstract Base Classes-Building Interface Hierarchies - Building Enumerable Types (IEnumerable and IEnumerator) Building Cloneable Objects (ICloneable) -Building Comparable Objects (IComparable) -The Interfaces of the System - Collections Namespace - Defining a Delegate in C# -Simplest Possible Delegate Example-Enabling Multicasting -C# Events - Lamdas Expression.

UNIT-IV DEVELOPING WINDOW APPLICATION FORMS   9

Windows Forms Types - Application Class- Functionality of the Control Class - Functionality of the Form Class- Building Windows Applications - Working with Status Strips - Working with ToolStrips - Building an MDI Application - Basic Controls.

ADO.NET: Introduction, ADO.NET architecture, The Connected Layer: DataProviders, DataAdapter, DataReader, ExecuteNonQuery method, ExecuteReader method,ADO.NET Overview – Using Database Connections, Commands, The Data Reader, The DataSet Class, Introducing ASP.NET web forms: Server Controls, Data Binding – Crystal Report- ASP.NET State Management, Tracing, Caching, Error Handling, Security, Deployment, User and Custom Controls - Master Pages - Windows Communication Foundation (WCF) – Introduction to Web Services.

Total No. of Periods: 45

COURSE OUTCOMES:

   CO1 : Knowledge about .Net Programming with fundamental concepts.
   CO2 : Ability to practice object oriented aspects of C#
   CO3 : Design an application on .NET
   CO4 : Deploy an web based application
   CO5 : Develop an application using ADO .Net and ASP .Net

REFERENCES

   1. Andrew Troelsen, "Pro C# 5.0 and the .NET 4.5 Framework" Apress, Sixth Edition,2021 ISBN: 978-1-4302-4233-8
   2. Christian Nagel et al. "Professional C# 2012 with .NET 4.5", Wiley India, 2012.
   3. Herbert Schildt, "The Complete Reference: C# 4.0", Tata McGraw Hill, 2012.
   4. E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2004.
   5. O`Reilly "Programming C# 5.0" ,O'Reilly Media ISBN: 978-1-4493-2041-6 | ISBN 10:1-4493-2041-4, October 2012.
   6. Michael Schmalz "C# Database Basics" O'Reilly Media ISBN:978-1-4493-0998-5, 2012

222CAE06- PROFESSIONAL COMMUNICATION

COURSE OBJECTIVES:

- To facilitate students amplify suitable language skills for academic and professional purposes
- To inculcate and develop strategies to understand and to increase students' efficiency in their academic and general reading
- To strengthen students' vocabulary power
- To familiarize students with different functions of technical and scientific English
- To coach the students in augmenting the technical writing skills like writing letters and reports in formal and business situations
- To strengthen Students' Creative skill

UNIT – I   BASICS OF TECHNICAL COMMUNICATION   9

Technical Communication – Features - Distinction between General and Technical Communication - Language as a Tool of Communication - Levels of Communication: Interpersonal, Organizational and Mass Communication - The Flow of Communication: Downward, Upward, Horizontal and Diagonal - Importance of Technical Communication - Barriers to Communication.

UNIT – II   CONSTITUENTS OF TECHNICAL WRITTEN COMMUNICATION   9

Word Formation - Synonyms and Antonyms (select vocabulary of about 500-1000 new words) – Abbreviations and Acronyms – Homonyms – Odd Man Out – Creative and Critical Thinking - Requisites of Sentence Construction - Paragraph Development: Techniques and Methods - Inductive, Deductive, Spatial, Linear, Chronological etc; Essay Writing – Narrative – Argumentative - Reading and Interpretation.

UNIT – III   FORMS OF TECHNICAL COMMUNICATION   9

Business Letters: Sales and Credit letters - Letter of Enquiry - Letter of Quotation, Order, Claim and Adjustment Letters - Job Application and Résumé - Reports: Types – Significance – Structure - Style & Writing of Reports – Agenda – Minutes of Meeting – Advertisement – Fliers – Brochures – Faxes – Internet Websites – Intranet Websites – Extranet Websites – Blogging.

UNIT – IV   PRESENTATION STRATEGIES   9

Defining Purpose - Analyzing Audience & Locale - Organizing Contents - Modes of Delivery: Extemporaneous, Manuscript, Impromptu and Memorization - Kinesics – Proxemics – Paralinguistics – Chronemics.

UNIT – V   CAREER SKILLS   9
One word substitution - Compound nouns - Phrasal verbs - Concord - British and American English - Infinitive and gerund - Life etiquettes - Emotional intelligence - Work ethic

Total No. of Periods: 45

COURSE OUTCOMES:

CO1 : The ability to strengthen technical communication
CO2 : The ability strengthen technical written communication
CO3 : The ability to understand and apply various forms of technical communication
CO4 : The ability to inculcate and present ideas effectively and efficiently
CO5 : Understand the basic grammatical structures and its applications and enhance their verbal skills in the screening tests competently both for recruitment and pursuing higher studies as well.

REFERENCES:

1. N. Uttham Kumar, "Professional English I & II", (with work book), Sahana Publications, Coimbatore, 2011.
2. Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, New Delhi.
3. Technical Communication – Principles and Practices by Meenakshi Raman & Sangeeta Sharma, Oxford Univ. Press, 2007, New Delhi.
4. Effective Technical Communication by Barun K. Mitra, Oxford Univ. Press, 2006, New Delhi.
5. Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan, Tata McGraw Hill & Co. Ltd., New Delhi.
6. How to Build Better Vocabulary by M.Rosen Blum, Bloomsbury Pub. London.
7. Word Power Made Easy by Norman Lewis, W.R.Goyal Pub. & Distributors; Delhi.
8. Developing Communication Skills by Krishna Mohan, Meera Banerji- Macmillan India Ltd. Delhi.
9. Manual of Practical Communication by L.U.B. Pandey & R.P. Singh; A.I.T.B.S. Publications India Ltd., Krishan Nagar, Delhi.

222CAE07-PERSONALITY DEVELOPMENT AND SELF GROOMING

COURSE OBJECTIVES:

- The course intends to develop talent, facilitate employability enabling the incumbent to excel and sustain in a highly competitive world of business.
- The programme aims to bring about personality development with regard to the different behavioural dimensions that have far reaching significance in the direction of organizational effectiveness.
- To make students know about self-awareness, life skills, soft skills, need for personal development etc.
- To get full benefit of this course, student needs to have basic idea about traits of Personality Development.
- Learning about the essential factors for personality development and bringing them into practice.

UNIT -I   INTRODUCTION TO PERSONALITY DEVELOPMENT: 9

Personality traits and theories - Self-Image and Self-Concept - Dressing Sense and Table Mannerisms, Diet, Exercise - Mental Health, Body Language.

UNIT -II   SELF GROOMING   9

Group Dynamics, Team Building, Time Management, Positive Attitude, Self-esteem, Self confidence, Assertiveness, Motivation Self grooming being an essential aspect of personality holds due importance. Creating positive attitude, confidence and mental ability to handle situations for constructive learning

UNIT -III   SOCIAL AND CORPORATE ETIQUETTES   9

Interpersonal Relations, Communication in organizations, Personal Branding, Leadership Skills, Presentation Skills, Personal skills- Negotiation skills, Conflict Management, Anger Management - emphasizes on developing negotiation skills, self presentation, creating a brand for self etc. required to work with groups from different disciplines, backgrounds, and expertise to accomplish organizational goals.

UNIT – IV   EFFECTIVE COMMUNICATION SKILLS   9

Effective Communication Skills: Effective Communication, Effective Speaking, Effective Listening, Persuasive Skills, Interview Skills

UNIT- V   TECHNIQUES OF PERSONALITY DEVELOPMENT   9

Techniques of Personality Development Techniques of Personality Development: Stress Management, handling stress, Time Management, Team Building, Goal Setting. Soft Skills: Knowing Yourself (SWOT), Emotional Intelligence, Empathy, Interpersonal Skills

Total No. of Periods: 45

COURSE OUTCOMES:

CO1 : The student will be able to understand, analyze develop and exhibit accurate sense of self.
CO2 : Think critically.
CO3 : Demonstrate knowledge of personal beliefs and values and a commitment to continuing personal reflection and reassessment.
CO4 : Learn to balance confidence with humility and overcome problems associated with personality.
CO5 : Basic idea of significance and reasons for Personality development and self grooming.

REFERENCES:

1. Alex K., Soft Skills – Know Yourself and Know the World, S. Chand & Company Pvt. Ltd., New Delhi, Third Revised Edition, 2016.
2. Bhatnagar Nitin and Mamta Bhatnagar, Effective Communication and Soft Skills: Strategies for Success, Pearson Education, New Delhi, 2011.
3. Chaturvedi P.D., Fundamentals of Business Communication, Pearson Education, New Delhi, 2012.
4. Dulek Ronald E. and John S. Fielden, Principles of Business Communication, Macmillan Publishing Company, London, 1990.
5. Francis Peter S.J., Soft Skills and Professional Communication, Tata McGraw Hill, New Delhi, 2012.
6. Goleman Daniel, Emotional Intelligence, BloomsBury Publishing, New Delhi, 2013.
7. Masters and Wallace, Personal Development for Life and Work, South-Western Cengage Learning, USA, 2010.
8. Onkar R.M., Personality Development and Career Management (A Pragmatic Perspective), S. Chand & Company Pvt. Ltd., New Delhi, Third Revised Edition, 2014

222CAE08 – APTITUDE SKILL TRAINING

COURSE OBJECTIVES:

- To improve verbal ability skill and communicative skill of the students.
- To enhance the analytical skill and problem solving skill of the students.
- To make them prepare for various public and private sector exams & placement drives.

UNIT-I   BASIC MATHEMATICS   **9**

Number Systems - LCM and HCF - Decimal Fractions – Simplification - Square Roots and Cube Roots - Average -Problems on Ages - Surds & Indices – Percentages - Problems on Numbers

UNIT – II   ARITHMETIC ABILITY   **9**

Permutation and Combinations – Probability - Profit and Loss - Simple and Compound Interest - Time, Speed and Distance - Time & Work - Ratio and Proportion – Area - Mixtures and Allegation

UNIT – III   ELEMENTARY STATISTICS   **9**

Mean , Median , Mode , Standard Deviation and Variance

UNIT – IV   DATA INTERPRETATION   **9**

Tables - Column Graphs - Bar Graphs - Line Charts - Pie Chart - Venn Diagrams

UNIT – V   DEDUCTIVE REASONING   **9**

Analogy - Blood Relation - Directional Sense - Number and Letter Series - Coding – Decoding - Calendars – Clocks - Venn Diagrams - Seating Arrangement.

Total No. of Periods: 45

COURSE OUTCOMES:

CO1 : Understand the basic concepts of quantitative ability
CO2 : Understand the basic concepts of logical reasoning Skills
CO3 : Acquire satisfactory competency in use of reasoning
CO4 : Solve campus placements aptitude papers covering Quantitative Ability, Logical
CO5 : Reasoning Ability

REFERENCES:

1. A Modern Approach To Verbal & Non Verbal Reasoning By R S Agarwal
2. Analytical and Logical reasoning By Sijwali B S
3. Quantitative aptitude for Competitive examination By R S Agarwal
4. Analytical and Logical reasoning for CAT and other management entrance test By Sijwali B S
5. .Quantitative Aptitude by Competitive Examinations by Abhijit Guha 4 th edition.

222CAE09- ENTREPRENEURSHIP DEVELOPMENT

COURSE OBJECTIVES:
- To equip and develop the learners entrepreneurial skills and qualities essential to undertake business.
- To impart the learner's entrepreneurial competencies needed for managing business efficiently and effectively.
- To explain concepts of Entrepreneurship and build an understanding about business situations in which entrepreneurs act
- To qualify students to analyze the various aspects, scope and challenges under an entrepreneurial venture
- To explain classification and types of entrepreneurs and the process of entrepreneurial project development and discuss the steps in venture development and new trends in entrepreneurship.

UNIT – I ENTREPRENEURIAL COMPETENCE   9

Entrepreneurship concept-Entrepreneurship as a Career-Entrepreneurial Personality - Characteristics of Successful Entrepreneurs-Knowledge and Skills of an Entrepreneur.

UNIT - II ENTREPRENEURIAL ENVIRONMENT   9

Business Environment - Role of Family and Society - Entrepreneurship Development Training and Other Support Organizational Services - Central and State Government Industrial Policies and Regulations.

UNIT - III BUSINESS PLAN PREPARATION   9

Sources of Product for Business - Prefeasibility Study - Criteria for Selection of Product - Ownership-Capital Budgeting- Project Profile Preparation - Matching Entrepreneur with the Project - Feasibility Report Preparation and Evaluation Criteria.

UNIT- IV LAUNCHING OF SMALL BUSINESS   9

Finance and Human Resource Mobilization - Operations Planning - Market and Channel Selection -Growth Strategies-Product Launching-Incubation, Venture capital, Start-ups.

UNIT - V MANAGEMENT OF SMALL BUSINESS   9

Monitoring and Evaluation of Business-Business Sickness-Prevention and Rehabilitation of Business Units-Effective Management of small Business-Case Studies.

Total No. of Periods: 45

COURSE OUTCOMES:

CO1 : The learners will gain entrepreneurial competence to run the business efficiently.
CO2 : The learners are able to undertake businesses in the entrepreneurial environment
CO3 : The learners are capable of preparing business plans and undertake feasible projects.
CO4 : The learners are efficient in launching and develop their business ventures successfully
CO5 : The learners shall monitor the business effectively towards growth and development.

REFERENCES:

1. S.S.Khanka, Entrepreneurial Development, S.Chand and Company Limited, New Delhi, 2016.
2. R.D.Hisrich, Entrepreneurship, Tata McGraw Hill, New Delhi, 2018.
3. Rajeev Roy, Entrepreneurship, Oxford University Press, 2nd Edition, 2011.
4. Donald F Kuratko,T.V Rao. Entrepreneurship: A South Asian perspective. Cengage Learning, 2012.
5. Dr. Vasant Desai, "Small Scale Industries and Entrepreneurship", HPH, 2006.
6. Arya Kumar. Entrepreneurship, Pearson, 2012.
7. Prasanna Chandra, Projects-Planning, Analysis, Selection, Implementation and Reviews, Tata McGraw-Hill, 8th edition, 2017.

PROFESSIONAL ELECTIVE LAB – II COURSES

222CAL01 – MACHINE LEARNING TECHNIQUES LAB

COURSE OBJECTIVES:

- Understanding the fundamental of python and R-Programming
- Design and Implements Prediction / Classification Process
- Design and implement Clustering algorithm
- Ability to develop a game and traffic control system using reinforcement learning.

LIST OF EXPERIMENTS

1. Implement a classifier for the sales data.

2. Develop a predictive model for predicting house prices

3. Implement the FIND-S algorithm. Verify that it successfully produces the trace in for the Enjoy sport example.(Tom Mitchell Reference)

4. Implement a decision tree algorithm for sales prediction/classification in retail sector

5. Implement back propagation algorithm for stock prices prediction

6. Implement clustering algorithm for Insurance fraud detection

7. Implement clustering algorithm for identifying cancerous data

8. Apply reinforcement learning and develop a game of your own.

9. Develop a traffic signal control system using reinforcement learning technique.

Total No. of Periods: 60

COURSE OUTCOMES:

CO1: Implement the various classifier techniques for the sales data.
CO2: Develop an application for the predictive model.
CO3: Design and Develop an application with back propagation algorithm and clustering algorithm.
CO4: Analyze the process of Reinforcement Learning for development of game.
CO5: Develop a traffic signal control system.

222CAL02- FULL STACK WEB DEVELOPMENT LAB

COURSE OBJECTIVES:

- To understand the types of PHP array and functions
- To learn the concepts GET / POST of form handling.
- To develop a web application using NodeJS and Express.
- To implement a SPA using React.
- To develop a full stack single page application using React, NodeJS, and a Database (MongoDB or SQL).

LIST OF EXPERIMENTS:

1. Implement

   a. Array Types

   b. String function

   c. Date function

   d. User Defined function.

2. Design a User Registration Form and display the user information in another form (Use GET/POST).
3. Design any simple Web Application using PHP and MYSQL.
4. Set Cookies and Retrieve the same in another page.
5. Create a NodeJS server using Express that stores data from a form as a JSON file and displays it in another page. The redirect page should be prepared using Handlebars.
6. Create a NodeJS server using Express that creates, reads, updates and deletes students' details and stores them in MongoDB database. The information about the user should be obtained from a HTML form.
7. Create a NodeJS server that creates, reads, updates and deletes event details and stores them in a MySQL database. The information about the user should be obtained from a HTML form.
8. Create a counter using ReactJS.
9. Create a Todo application using ReactJS. Store the data to a JSON file using a simple NodeJS server and retrieve the information from the same during page reloads.
10. Create a simple Sign up and Login mechanism and authenticate the user using cookies. The user information can be stored in either MongoDB or MySQL and the server should be built using NodeJS and Express Framework.

Total No. of Periods: 60

COURSE OUTCOMES:

CO1 : Can able to work with PDO PHP code.
CO2 : Can able to work with query manipulations.
CO3 : To develop and deploy server side applications using NodeJS.
CO4 : To implement and architect database systems in both NoSQL and SQL environments.
CO5 : To develop a full stack single page application using React, NodeJS.

222CAL03 - C# AND DOT NET PROGRAMMING LAB

COURSE OBJECTIVES:

- Design, document, code and test small C# console and GUI applications.
- Design, document, code and unit test class libraries.
- Use an object browser and .NET documentation to examine C# and the .NET framework namespace contents.

LIST OF EXPERIMENTS

1. Programs using Branching, and Looping.
2. Programs using Methods, Arrays, and Strings.
3. Programs using Inheritance.
4. Programs using Delegates, Events, Errors and Exceptions.
5. Program to Build a Calculator Widget.
6. Design a simple application based on LAMDA Expression
7. Design and develop any window application using Delegates.
8. Design and Deploy a MDI Application using Events
9. Implement ADO.Net Window applications
10. Design and develop user and custom control in ASP.Net

Total No. of Periods: 60

COURSE OUTCOMES:

CO1 : Able to create simple window application using Branching, and Looping.
CO2 : Deploy the process Delegates, Events, Errors and Exceptions.
CO3 : Develop an simple application such as Calculator and LAMDA Expression
CO4 : Design and Deploy a MDI Applications.
CO5 : Design and Develop a simple application using ASP. Net.

220CAL04 - DATA MINING AND DATA WAREHOUSING LAB

COURSE OBJECTIVES:

- Practical exposure on implementation of well-known data mining tasks.
- Exposure to real life data sets for analysis and prediction.
- Practice data mining project for a given practical domain.

LIST OF EXPERIMENTS

1. Performing data pre-processing tasks for data mining in WEKA.
2. Implement the algorithm to generate a decision tree and convert it into "if –then – else
3. rules"
4. Implement FP-Growth and Apriori algorithm.
5. Implement association rule mining.
6. Implement clustering algorithms
7. Implement Naïve Bayes classification.
8. Implement K- nearest neighbour classification
9. Implement Linear Regression
10. Implement defining subject area, design of fact dimension table.
11. Implement OLAP, roll up, drill down, slice and dice operation.

Total No. of Periods: 45

COURSE OUTCOMES:

CO1: Design Pre-Processing Task with help of WEKA Tools.
CO2: Develop an algorithm using Apriori algorithm and Association rule mining.
CO3: Demonstrate the role of Cluster and Naïve Bayes Classifications.
CO4: Implement Linear Regression
CO5: Able to Design and Develop an application with Fact dimension and OLAP operations.

222CAL05- CLOUD COMPUTING LAB

COURSE OBJECTIVES:

- To Develop web application in cloud.
- To learn the design and development process involved in creating a cloud based applications.
- Practice Schedule algorithm
- Understand transfer of file from one virtual machine to another
- To learn parallel programming using Hadoop

LIST OF EXPERIMENTS

1. Install Virtual Box / VMare Workstation with different Platform

2. Install a C Compile r in the virtual machine created using virtual box and executed a simple program.
3. Install Google App Engine. Create a Hello World app and other simple application using python / Java
4. Use GAE Launcher to launch the web applications.

5. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not present in CloudSim.
6. Find a procedure to transfer the file from one virtual machine to another virtual machine.
7. Find a procedure to launch virtual machine using trystack (Online OpenStack Demo Version)
8. Install Hadoop single node cluster and run simple application like word count.

Total No. of Periods :45

COURSE OUTCOMES:

CO1 : Configure the various virtualization tools such virtual box / VM Workstations.
CO2 : Design and Deploy a web application in PaaS Environment
CO3 : Learn how to simulate a cloud environment to implement new scheduler
CO4 : Install and use a generic cloud environment that can be used as a private cloud
CO5 : Manipulate the larger dataset in parallel environment.

222CAL06 - EXECUTIVE COMMUNICATION LAB

SOFT SKILLS

Team Skills :

Team building and leadership - Evolution of groups into teams - Group dynamics - Emergence of leadership - Intra-group dynamics - Inter-group dynamics - Stress management - Inter dependency - Assessment of team-based projects

Time Management:

Goal setting - Effective time management

Interpersonal Skills:

Negotiations - Conflict management - Social skills - Assertive skills - Cross-cultural communications

Leadership Skills:

Concepts of leadership - Leadership styles - Insights from great leaders

Listening:

Scientific lectures - Educational videos - Gap filling exercises - Presentations - Formal Job interviews - Debates - Panel discussions - INK talks

Speaking:

Narrating personal experiences - Presentation - Group discussion - Simulations - Find the difference - Giving and asking for directions - News brief - Extempore/Impromptu

Reading:

Brochures - Social media messages - Newspaper - Editorials - Case studies - Critical reviews - Excerpts of interview with professionals - Technical texts

Writing:

Résumé - Letter writing - E-mail etiquettes - Report - Developing hints - Note-making - Note-taking

Grammar:

Concord - Error correction - Editing - Verbal analogy - Arranging sentences

Total No. of Periods: 45

COURSE OUTCOMES:

CO1 : Exhibit necessary soft skills to fulfill the professional demands and enrich grammatical knowledge.

CO2 : Listen and comprehend the various strategies of listening and its significance in their area of specialisation successfully.

CO3 : Speak appropriately and effectively in varied formal and informal contexts.

CO4 : Read and comprehend texts effortlessly and understand the prevailing practices of testing in the recruitment process by the corporates and the institutional selection processes.

CO5 : Communicate the corporate and social requirements in an impressive written mode.

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1. Andrea J. Rutherford, "Basic Communication Skills for Technology", 1st Edition, Pearson Education Asia (Singapore) Pvt. Ltd., Bangalore, 2001.
2. Bhatia R.C., "Business Communication", Ane Books India, New Delhi, 2008.
3. Raman, Meenakshi and Sangeetha Sharma, "Technical Communication – English Skills for Engineers", 2nd Edition. Oxford University Press, New Delhi, 2009.
4. Ashraf M Rizvi, "Effective Technical Communication", 5th Edition, The McGraw-Hill PublishingCompany Ltd., New Delhi, 2007.
5. Mohan Krishna Banerjee Developing Communications Skills Macmillan India Ltd. 2009.
6. R S Aggarwal , "Objective English" , Macmillan India Ltd. 2007.

222CAL07 - REPORT WRITING LAB

COURSE OBJECTIVES:

- To Provide fundamental concept of Report Preparation
- To Gain Knowledge about Writing Tool
- To Practice a Report Writing for an application Project
- To Implement the concept of Thesis Writing

LIST OF EXPERIMENTS

1. Use of MS Word and Latex for report preparation.
2. Use of Excel for graphs
3. Use of report writing tools – Oracle Report Builder, Crystal Reports – Visual Basic
4. Report Writing for an application project on any one of the following;
   - Student Information System
   - Banking Operation
   - Admission System
   - Railway reservation System
5. Header, Body computation and Footer generation for Reports.
6. Thesis writing:
   - Introduction on Problems
   - Literature survey – Existing work
   - Architecture Design
   - Algorithms and Implementation
   - Presentation and results
   - Writing Conclusion
   - Display of Reference

Total No. of Periods: 45

COURSE OUTCOMES:

CO1: Acquire Language Skills required to Write Reports
CO2: Generate the Graphs for various analysis
CO3: Explore Knowledge in Report Writing Tools
CO4: Able to Write a Report for an Application Projects
CO5: Known about Thesis Writing

222CAE11- WASTE TO ENERGY

COURSE OBJECTIVES:

- To learn fundamental and practical aspects for the treatment and simultaneous valorization of waste (including wastewater) toward energy generation
- To enable students to understand of the concept of Waste to Energy.
- To link legal, technical and management principles for production of energy form waste.
- To learn about the best available technologies for waste to energy.
- To analyze of case studies for understanding success and failures.

UNIT-I   INTRODUCTION TO ENERGY FROM WASTE   9

Classification of waste as fuel – Agro based, Forestresidue, Industrial waste - MSW – Conversion devices – Incinerators, gasifiers, digestors

UNIT-II   BIOMASS PYROLYSIS   9

Pyrolysis – Types, slow fast – Manufacture of charcoal – Methods - Yields and application – Manufacture of pyrolytic oils and gases, yields and applications.

UNIT-III   BIOMASS GASIFICATION   9

Gasifiers – Fixed bed system – Downdraft and updraft gasifiers – Fluidized bed gasifiers – Design, construction and operation – Gasifier burner arrangement for thermal heating – Gasifier engine arrangement and electrical power – Equilibrium and kinetic consideration in gasifier operation.

UNIT-IV   BIOMASS COMBUSTION   9

Biomass stoves – Improved chullahs, types, some exotic designs, Fixed bed combustors, Types, inclined grate combustors, Fluidized bed combustors, Design, construction and operation - Operation of all the above biomass combustors.

UNIT-V   BIOGAS   9

Properties of biogas (Calorific value and composition) - Biogas plant technology and status - Bio energy system - Design and constructional features – Biomass resources and their classification - Biomass conversion processes - Thermo chemical conversion - Direct combustion - biomass gasification - pyrolysis and liquefaction - biochemical conversion - anaerobic digestion - Types of biogas Plants – Applications - Alcohol production from biomass - Bio diesel production - Urban waste to energy conversion - Biomass energy programme in India.

Total No. of Periods: 45

COURSE OUTCOMES:

CO1 : Become aware of global energy scenarios

CO2 : Understand actions that can be applied in the context of environmental protection and sustainability

CO3 : Develop skills on main principles of chemical and biotechnological waste-to energy processes

CO4 : Understand the advantages of waste-to-energy conversion and their difficulties to be implemented

CO5 : Known and apply tools for the techno-economic analysis of the studied processes

REFERENCES:

1. Non-Conventional Energy, Desai, Ashok V., Wiley Eastern Ltd., 1990.
2. Biogas Technology - A Practical Hand Book - Khandelwal, K. C. and Mahdi, S. S., Vol. I & II, Tata McGraw Hill Publishing Co. Ltd., 1983.
3. Food, Feed and Fuel from Biomass, Challal, D. S., IBH Publishing Co. Pvt. Ltd., 1991.
4. Biomass Conversion and Technology, C. Y. WereKo-Brobby and E. B. Hagan, John Wiley & Sons, 1996.

222CAE12- FUNDAMENTALS LAWS AND ETHICS

COURSE OBJECTIVES:

- To gain basic knowledge in Laws and Ethics to understand the concepts of regulatory compliance, requirements.
- Desired ethics expected from professionals.
- Acquire adequate knowledge of the basic concepts of laws
- Understand the basic knowledge of ethics including allied regulatory compliance and requirements

UNIT - I   FUNDAMENTALS OF COMMERCIAL LAWS   9

Laws of Contracts-Essential elements of a contract, offer and acceptance-Void and voidable agreements-Consideration, legality of object and consideration-Capacity of Parties, free consent-Quasi-contracts, contingent contracts, termination or discharge of contracts-Laws relating to Sale of Goods-Definition-Transfer of ownership-Performance of the Contract of Sale

UNIT- II   NEGOTIABLE INSTRUMENTS ACT & INDIAN PARTNERSHIP ACT   9

Negotiable Instruments Act,1881-Acceptance and negotiation -Rights and liabilities of Parties-Dishonour of a Negotiable Instrument-Hundis-Bankers and Customers-Indian Partnership Act,1932-Nature of Partnership-Rights and liabilities of Partners -Dissolution of Firms

UNIT – III   FUNDAMENTALS OF INDUSTRIAL LAWS   9

Factories Act,1948-Objective, Scope-Applicability of Factories Act,1948-Payment of Wages Act, 1936 and Minimum Wages Act, 1948-Objective, Scope-Applicability of Payment of Wages Act, 1936 and Minimum Wages Act, 1948-The Employees' State Insurance Act, 1948-Objective, Scope-Applicability of ESI Act, 1948

UNIT- IV   THE CHILD LABOUR (PROHIBITION AND REGULATION) ACT   9

The Child Labour (Prohibition and Regulation) Act, 1986 – Concepts and Definition
Prohibition of Children in certain Occupations and Processes (Sec 3) -Regulation of Conditions of Works of Children -Penalties (Section 14) -Power of Central / Appropriate Government Where to make a Complaint -Prohibited Occupations -Prohibited Processes.

UNIT –V   FUNDAMENTALS OF ETHICS   9

Ethics – meaning, importance- The Seven Principles of Public Life –selflessness, integrity, objectivity, accountability, openness, honesty and leadership-The relationship between Ethics and Law

Total No. of Periods: 45

COURSE OUTCOMES:

CO1 : Define, distinguish and apply the basic concepts and terminology of the law of contract.

CO2 : Define and distinguish amongst the various processes involved in contract formation

CO3 : Demonstrate ethical awareness, the ability to do ethical reflection, and the ability to apply ethical principles in decision-making.

CO4 : Developing a student's ethical awareness, reflection, and decision-making ability is central to a Core Curriculum.

CO5 : Analyze the process of Fundamental Ethics.

REFERENCES:

1. Barrett, Edward F., "The Adversary System and the Ethics of Advocacy," Notre Dame Lawyer 37: 479–88 (1962).
2. Alexy, Robert, The Argument from Injustice (Oxford: Oxford University Press, Paulson, Bonnie Litschewski and Paulson, Stanley L., trans. 2002).
3. Amsterdam, Anthony, and Bruner, Jerome, Minding the Law (Cambridge, Mass.: Harvard University Press 2000).

BRIDGE COURSES

222CAB001 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING -II

COURSE OBJECTIVES:

- To understand the fundamental concepts of database management systems.
- Understand the basic concept of web design
- To know the basic principle of management functions
- To gain the knowledge of statistical methods.

UNIT-I   DATABASE MANAGEMENT SYSTEM   9

Database System vs File System – View of Data – Data Models- Database Languages Transaction Management – Database Systems Structure- History of Database Systems- Entity Relationship Model.

UNIT- II   QUERY PROCESSING SQL   9

Basic Structure – Set Operations – Complex Queries – Joined Queries – DDL Embedded SQL- Dynamic SQL – Other SQL Functions – Query by Example – Integrity and Security of Searching – Relational Data Base Design.

UNIT- III   HTML INTRODUCTION   9

Basic tags – elements – attributes – phrase tags – meta tags – Commends tag – formatting – images – tables – list – forms – embedded with multimedia – div tag – CSS – inline – embedded – external.

UNIT- IV   HUMAN RESOURCE MANAGEMENT   9

Introduction to management function: Human Resource Development – selection & training, Marketing Management- Concept, Scope and four components i.e. product, Price, Place and Promotion, Manufacturing Management: - Production System, Production Planning and Control, Strategic Planning.

UNIT- V   STATISTICS   9

Statistics methods- Sampling, Population, Sample and Sample size, Methods of Sampling, Time series analysis, Hypotheses, Procedure of testing of hypothesis, Test of Significance, Chi Square test 'Z' test and T-Test.

Total No. of Periods: 45

COURSE OUTCOMES:

CO1: Demonstrate the role of Database Management System
CO2: Design a simple program using Query Processing.
CO3: Design a Simple web application using HTML.
CO4: Analyze the Process of Human Resource Management.
CO5: Able to Understand the concept of statistics.

REFERENCES:

1. Morris Mano, "Digital Logic & Computer Design" PHI 2017.
2. Thomas Cannolly and Carolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education, 2007.
3. R.Elmasri, S.B. Navathe, "Fundamentals of Database Systems", Fifth Edition, Pearson Education Addison Wesley, 2007.
4. M.Morris Mano," Computer System Architecture", Prentice Hall of India, 3rd edition, 2005
5. Mirza S. Saiyadain "Human Resources Management" Tata McGraw –Hill, 4th Edition, 2009.
6. Sarah Gilmore & Steve Williams "Human Resource Management" Oxford University Press, 2010.
7. Kandasamy.P,Thilagavathy,K.,&Gunavathi.K., "Probability, Statistics and Queueing Theory"., S.Chand& Company Ltd., New Delhi. 8. Miller and Freund., "Probability and Statistics for Engineers", Pearson Education, Asia, 7th edition.

222CBP001 - FUNDAMENTALS OF COMPUTING AND PROGRAMMING LAB – II

COURSE OBJECTIVES:

- To familiarize the fundamental concept of tables
- To learn Basic DCL and DML commands
- To gain fundamental knowledge of webpage design
- To learn attractive webpage using CSS

LIST OF EXPERIMENTS

1. Execute single commend line for table

2. Execute group function for a table

3. DCL Commands

4. DML Commands

5. Create and manipulate a various Complex Queries

6. Design a simple webpage using forms in HTML

7. Design a simple webpage using DIV tag with CSS.

8. Design a simple webpage using TABLE tab in HTML

COURSE OUTCOMES:

CO1: Understand and manipulate table operations
CO2: Implement various DML and DDL commands
CO3: Design simple web page using HTML Forms.
CO4: Develop attractive style sheet using CSS
CO5: Design and Develop a HTML Web Page using Tables