

**Gondwana University,  
Gadchiroli**



**Choice Based Credit System (CBCS)  
Syllabus**

**Of**

**B.C.A. - III Semester – V & VI  
(Three Years Degree Course)**

**Prepared by  
I.T. And Application Board**

**2019-2020**

## BCA III (Semester V)

| Subject   | Paper Code   | Paper Name  | Total Period# /Week | Credit    | % of Assessment |            |            |                    |
|---|--|---|---------------------|-----------|-----------------|------------|------------|--------------------|
|   |  |   |                     |           | IA              | UE         | Total      | Min. Passing (40%) |
| Discipline Specific Elective Course (DSEC-I)      | UBCAT501.1<br>UBCAT501.2<br>UBCAT501.3                   | (Select Any 2)<br>• Theory of Computational Analyzer<br>• Scripting Languages<br>• Python Programming   | 3                   | 2         | 10              | 40         | 50         | 40                 |
|   |  |   | 3                   | 2         | 10              | 40         | 50         |                    |
| Discipline Specific Elective Course (DSEC-II)     | UBCAT502.1<br>UBCAT502.2<br>UBCAT502.3                   | (Select Any 2)<br>• Data Warehousing and Data Mining<br>• Software Engineering<br>• Operation Research & Statistics   | 3                   | 2         | 10              | 40         | 50         | 40                 |
|   |  |   | 3                   | 2         | 10              | 40         | 50         |                    |
| Discipline Specific Elective Course (DSEC-III)    | UBCAT503.1<br>UBCAT503.2<br>UBCAT503.3                   | (Select Any 2)<br>• CORE JAVA<br>• Computer Graphics<br>• SQL Server  | 3                   | 2         | 10              | 40         | 50         | 40                 |
|   |  |   | 3                   | 2         | 10              | 40         | 50         |                    |
| Skill Enhancement Course (SEC-III)                | UBCAT504.1<br>UBCAT504.2<br><br>UBCAT504.3<br>UBCAT504.4 | (Select Any One)<br>• Computers for manager<br>• A Certification Course from IIT Spoken Tutorial, Mumbai<br>• Personality Development<br>• Accounting & Office Management | 1                   | 2         | 50              | -          | 50         | 20                 |
| Discipline Specific Elective Course (DSEC-IV)     | UBCAP505   | Lab based on (DSEC-I)   | 4 Prac. Per Batch   | 2         | 20              | 30         | 50         | 20                 |
| Discipline Specific Elective Course (DSEC-V)      | UBCAP506   | (Lab Based on (DSEC-III )   | 4 Prac. Per Batch   | 2         | 20              | 30         | 50         | 20                 |
| Ability Enhancement Compulsory Courses (ACCC-VII) | UBCAS507   | Seminar (Skill Based)   | 3                   | 4         | 100             | --         | 100        | 40                 |
| <b>Total</b>                                      |  |   |                     | <b>22</b> | <b>250</b>      | <b>300</b> | <b>550</b> | <b>220</b>         |

**Note:-1)** In a Group, if any student remains absent in one of the paper then candidate result will be considered as fail in that group even though he/she has scored minimum passing marks in other paper of that group. Candidate need to appear in both the papers of that group.

**2)** In Practical student must appear External Practical Exam conducted by University in order to clear practical exam.

**(Select Any Two)**  
**B.C.A. - III (SEMESTER – V)**  
**PAPER- I (Elective I) :- Theory of Computational Analyzer**  
**[Max. Marks: 40]**

---

**UNIT-I: FINITE AUTOMATON**

**Finite State Machine:** Finite automaton Model, Acceptance of Strings and Languages, Types of FA (Deterministic Finite Automaton, Non-Deterministic Finite Automaton, NFA with  $\epsilon$  Moves, Two way Deterministic Finite Automaton), Construction of DFA, Construction of NFA, Equivalence between NFA and DFA, Conversion of NFA into DFA.

**UNIT- II: REGULAR EXPRESSION&CONTEXT FREE GRAMMAR**

**Regular Expression:** Manipulation of Regular Expression, Equivalence between RE and FA, Pumping Lemma for Regular Set, Regular Grammar, Types of Regular Grammar. **Context Free Grammar:** Derivation Tree, Chomsky Normal Form, Greibach Normal Form, Ambiguity in Grammar, Useless Symbol.

**UNIT- III: PUSH DOWN AUTOMATON AND TURING MACHINE**

**Push Down Automaton:** Definition, Model, Acceptance of CFL, Equivalence between CFL and PDA, Construction of PDA, Intercon version, Pumping Lemma for CFL. **Turing Machine:** Definition, Model, Acceptance of REL, Types of TM, Construction of TM, Linear Bounded Automaton.

**UNIT- IV: INTRODUCTION TO COMPILER**

**Compiler :**Definition of Compiler, Structure of Compiler, Lexical Analysis, Transition Diagram for Identifier and Constant, Syntax Analysis, Parse Tree Construction, Intermediate Code Generation, Code Optimization, Principle sources of Code Optimization, Book keeping , Error Handling, Types of Compiler.

**Books:**

1. J. D. Ullman and H. E. Hopcraft, "Introduction to Automata Theory, Languages and Computation", Narosa Publication, ISBN: 81-85015-96-1
2. A. V. Aho, and J. D. Ullman, Principle of Compiler Design, Narosa Publication  
ISBN: 81-85015-61-9
3. Dr. S.B. Kishor, "Theory of Computation", Das Ganu Publication, ISBN: 978-93-81660-15-.

**References:**

1. John C Martin, "Introduction to Languages and the Theory of Computation", Tata McGraw-Hill Publication, ISBN : 0-07-049939-X
2. K. L. P. Mishra and N. Chandrasekhar, "Theory of Computer Science", Prentice Hall of India  
ISBN: 81-203-1271-6

**B.C.A. - III (SEMESTER – V)**  
**Paper I (Elective II) –: Scripting Languages**

**[Max. Marks: 40**

---

**UNIT I: INTRODUCTION TO JAVA SCRIPT**

Features of JavaScript, Structure and Basic Syntax of JavaScript, Data Types, Operators Supported By JavaScript, Control Structure, Dialog Boxes Supported By JavaScript, Functions In JavaScript Built In Function, User Defined Function, Recursion, Arrays. **JavaScript Document Object Model** - Built-In Objects In JavaScript, String Object, Math Object, Date Object, Boolean Object, Number Object, User Defined Objects, Handling (WEB PAGE) Events Using JavaScript.

**UNIT II: INTRODUCTION TO VBSCRIPT**

Features of VBScript, Data Types in VBScript, Elements of VBScript: Identifiers, Operators, Control Statements, Control Structure. **Functions** - Variant Function, Math Function, Formatting Function, String Manipulation Function, Type Conversion Methods Supported By VBScript, Arrays in VBScript, Regular Expression.

**UNIT III: CSS**

Creating Style Sheet, CSS Properties, CSS Styling(Background, Text Format, Controlling Fonts) Working with Block elements and Objects, Working with Lists and Table, CSS Id and Class Box Model(Introduction, Border properties, Padding Properties, Margin properties),CSS Advanced(Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector),CSS Color Creating page Layout and Site Designs.

**UNIT IV: INTRODUCTION TO XML**

What is XML, XML verses HTML, XML Terminology, XML Standards, XML Syntax Checking, the idea of mark-up, XML Structure, Organizing information in XML, Creating well-formed XML, and XML Namespaces. **DTD** - Introduction to DTD, Document Type Declaration, Element Type Declaration, Attribute Declaration, Conditional Section, Limitations of DTD.

**Books:**

- 1) Dr. S.B. Kishor, S.S. Gudelliwar, Dr.Rajani D. Singh, “WEB DESIGNING (HTML, JAVA SCRIPT & VB SCRIPT”, Das Ganu Prakashan, ISBN- 978-93-81660-05-08.
- 2) Beginning CSS: Cascading Style Sheets for Web Design, Wiley India, author Ian Pouncey, Richard York, and ISBN: 978-0-470-89152-0.

**References:**

- 1) NIIT, “Building Web Application”, Prentice Hall of India, ISBN 81-203-2714-4.
- 2) Lee Purcell, Mary Jane Mara, “The ABCs of JavaScript”, ISBN 81-7029-826-1.

### **UNIT I: FEATURES OF PYTHON**

General Description of Python, Magic of Python, Elements of Program, Output Statements, Lexical Matters Writing and executing simple program, Built-in Data Types, Declaring variables, Assignment Statement, Computing with Numbers:- Numeric Data Type, Using Math Library, Type Conversion. **Input-Output:** Printing on screen, reading data from keyboard.

### **UNIT II: COMPUTING WITH STRINGS**

The String Data Type, String Processing, String and Secret Codes, Output as a String Manipulation. **Statements:** Import, Print, if: elif: else, for, while, try: except, raise, with **Collections:** Lists, Dictionaries – Concept of dictionary, techniques to create, updates& deletes dictionary items.

### **UNIT III: FUNCTIONS**

Defining a Function, calling a Function, Advantages of Functions, Types of Functions, Function parameters, Formal parameters, Actual parameters, and Anonymous Functions, Global and Local variables. **Modules:** Importing Module, Creating & Exploring Modules, Math Module, Random Module, and Time Module.

### **UNIT IV: OBJECT AND GRAPHICS**

The Object of Objects, Graphics Programming, Using Graphical Objects, Graphing Future Value, Choosing Coordinates, Interactive Graphics, Graphics Module Reference, **GUI Applications:** Introduction, PyGtk, Message dialog box, Input dialog box, File selection dialog box, Easy GUI.

#### **Books:**

- 1) Charles Dierbach, Introduction to Computer Science using Python, Wiley, 2013.
- 2) James Payne , Beginning Python: Using Python 2.6 and Python 3, Wiley India, 2010 .

#### **References:**

- 1) Dave Kuhlman, A Python Book: Beginning Python, Advanced Python, and Python Exercises, EBook, 2015 .
- 2) John M. Zelle, Python Programming: An Introduction to Computer Science, EBook, 2002.

(Select Any Two)

**B.C.A. - III (SEMESTER – V)**

**Paper- II (Elective I)-: Data Warehousing and Data Mining**

**[Max.Marks: 40**

---

**UNIT I: DATA PROCESSING AND DATA WAREHOUSING**

Data Processing: Data and Information, Value of Information, Quality of Information, Information Life Cycle, Need of Data Processing, Database Terminology, Types of Database, Database Approach, MIS, KMS, BI

Introduction to Data Warehousing: Data Warehousing Architecture, Data Warehousing Design Consideration, Components of Data Warehousing, Data Cleaning, Data Integration and Transformation, Data Reduction, Data Decentralization. Tools for Data Warehousing.

**UNIT II: OLTP AND OLAP SYSTEM**

Introduction to OLAP definitions, Characteristics, Demand, Features, Advantages and Disadvantages and Functions. Working of OLAP, OLAP Operation: Roll Up, Drill Down, Dice, Slice, Pivot. Types of OLAP Server.

OLTP, Comparison between OLTP and OLAP

**UNIT III: METADATA AND DATA MARTS**

Metadata Definition, Granular Data, Data Marts Definition and Types, Data Requirements for Data Marts: External Data, Reference Data, Data Model for Data Mart, Steps in implementing a data mart, Maintenance of Data Marts, Performance Issues and Security in a Data Mart.

**UNIT IV: DATA MINING**

Introduction to Data Mining, From Data Warehousing to Data Mining, Data Mining Functions, Major Issues in Data Mining, Steps of Data Mining, Data Mining Algorithm : Database Segmentation, Link Analysis & Predictive Modelling, Data Mining Tools, Applications of Data Mining.

**Text Books:**

1. R. Kimball: The Data Ware House Life Cycle Tool Kit, Wiley Press, John Wiley and Sons ASIA) Pvt. Ltd.
2. J. Han and M. Kamber: Data Mining Concepts and Techniques, Elsevier Pub. Indian Reprint, 2004.
3. Dr. S. B. Kishor, Database Management System, Das Ganu Prakashan
4. C,S.R. Prabhu, Data Warehousing, PHI Learning Pvt. Ltd., Third Edition, 2013

**Reference Books:**

1. Introduction to Data Mining – Tan, Steinbach, Vipin Kumar, Pearson Education.
2. Fundamentals of Data Warehouses, Jarke, Vassiliou, 2nd Edition, Springer.
3. System Analysis and Design, Dr. S. B. Kishor, Das Ganu Prakshan
4. Data Mining- with Microsoft SQL Server 2000, Claude Seidman, Prentice Hall of India Pvt. Ltd. 2005

**B.C.A. - III (SEMESTER – V)**  
**PAPER- II - (Elective II): Software Engineering**

**[Max. Marks: 40**

---

**UNIT - I: INTRODUCTION TO SOFTWARE ENGINEERING**

**Introduction to Software Engineering:** The Evolving Role of Software, Changing Nature of Software, Software myths. **A Generic view of process:** Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

**UNIT - II: PROCESS MODELS**

**Process Models:** The waterfall model, Incremental process models, Evolutionary process models, The Unified process. **Software Requirements:** Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document. **Requirements engineering process:** Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

**UNIT - III: SYSTEM MODELS**

**System Models:** Context Models, Behavioral models, Data models, Object models, structured methods. **Design Engineering:** Design process and Design quality, Design concepts, the design model. **Creating an architectural Design:** Software architecture, Data design, Architectural styles and patterns, Architectural Design.

**UNIT - IV: TESTING STRATEGIES**

**Testing Strategies:** A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging. **Product metrics:** Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance. **Metrics for Process and Products:** Software Measurement, Metrics for software quality.

**Books:**

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition McGraw Hill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson education.
3. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers

**Reference:**

1. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.
2. Systems Analysis and Design- Shely Cashman Rosenblatt, Thomson Publications.
3. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies

**B.C.A. - II (SEMESTER – V)**  
**Paper –II (Elective III) -: Operation Research & Statistics**

**[Max Marks: 40**

---

**UNIT I: INTRODUCTION OF OPERATION RESEARCH**

Definition and Meaning of Operational Research, Introduction to Operational Techniques, Basics of Operational Research, Different Phases of an Operational Research Study, Scope and Limitations of Operational Research, Mathematical Modeling of Real Life Problem.

**UNIT II: LINEAR PROGRAMMING AND ASSIGNMENT PROBLEM**

Linear Programming and Allocation Models Introduction, Requirement Applications, Formulation, Solution by Graphical Methods, Assignment and Transportation problems: Introduction, Network Analysis, PERT / CPM Method.

**UNIT III: STATISTICAL DATA COLLECTION**

Statistical Data Collection and Measures of Central Tendency Meaning, Definition of Statistics, Function, Scope, Merits, Demerits, Importance of Statistics. Statistical Data Collection- Primary and Secondary Data, Methods of Data Collection, Measures of Central Tendency – Arithmetic Mean, Median, Mode, Geometric Mean, Harmonic Mean.

**UNIT-IV: REGRESSION ANALYSIS**

Regression Analysis- Simple Problems on Regression, Mean and Standard Deviation Method, Equation Method (Including One Equation). Index Number- Laspeyre's Method, Paasche's Method, Dorbish and Bowley Method and Fisher Ideal Method.

**Books:**

1. J.K. Sharma, "Operation Research Problems and Solutions", Macmillan, ISBN 9781403931511
2. V.K. Kapoor, "Operation Research" ISBN: 0470112689
3. Basic of Computer and Statistical Techniques – Dr. Rahul Sawlikar and Dr. S. B. Kishor, Das Ganu Prakashan, Nagpur – ISBN –978-81-921757-8-2

**References:**

1. Sancheti & Kapoor, "Business Statics", Sultan Chand & Sons, New Delhi.
2. Kanti Swarup, P.K. Gupta, Man Mohan, "Operation Research", Sultan Chand & Sons, ISBN81-8054-535-0
3. Statistical Methods- S.P.Gupta, S. Chand and Company, New Delhi
4. Statistics, Theory, Method and Application- Sancheti and Kapoor.
5. Fundamental of Statistics – A. K. Agrawal and Sahib Singh, PHI 4TH Edition



**(Select Any 2)**  
**B.C.A. - III (SEMESTER – V)**  
**Paper III (Elective I) -: CORE JAVA**

**[Max. Marks: 40**

---

**UNIT I: INTRODUCTION OF JAVA**

**Introduction of Java:** Features of Java, Java Applications, JDK Environment, Structure of Java Program, Java coding Conventions. **Basic Concepts of Java:** Identifiers and Keywords, Constants, Variables: -Variable naming, variable initialization, assign values, Rules of variables, Scope of variable, Data Types in Java. **Operators:** Arithmetic, Assignment, Relational, Logical, Conditional, Comparison, Unary, Shift, Bit- Wise, Special. Conditional Statements, Looping Structure, Arrays and its methods, Streams: Stream, Stream History classes, Methods and Constructors.

**UNIT-II: CLASSES OBJECTS**

**Fundamentals:** Classes Object, Access Specifiers & Modifiers: -Public, Private, Protected, Static & Final, Overloading. **Constructors:** Constructor Overloading, Finalization, **Inheritance:** Different types of Inheritance, Dynamic method dispatch. Interfaces, Implementing Interfaces.

**UNIT-III: PACKAGES**

**Packages:** Importing Packages and Classes, User defines packages, **Exception Handling:** Types of Error, Throwable Class, Types of Exceptions, try, catch, finally, throws keywords, creating your own exception, exceptions and Inheritance. **Multithreading:** Multithreading Concept, Thread Life Cycle, Creating multithreading Application, Thread Priorities, Daemon Thread, Thread synchronization.

**Applets-**Applet, Advantages of Applet, Applet Life Cycle, Applet Context, Graphics in Applet, Parameterized Applet, Inter applet communication.

**UNIT-IV: ABSTRACT WINDOW TOOLKIT**

**AWT:** Components and Graphics, Containers, Frames and Panels, Layout Managers-Border Layout, Flow Layout, Grid Layout, Card Layout. **AWT Controls:** Text Field, Text Area, Label, Button, Choice, List Box and Checkbox. Event Delegation Model, Event Source and Handlers, Event Categories, Listeners. **File IO:** Files, File class Tests and Utilities, Serialization and Deserialization.

**Books:**

- 1) Dr. S. B. Kishor, Dr. Rajani Singh “Programming in JAVA”, Das Ganu Pub.
- 2) Cay S Horstmann Gary Cornell, “Core JAVA 2 Vol -1, 2”, The Sun Micro Systems Press,  
New Delhi, ISBN-13: 978-0470105559
- 3) E. Balaguruswamy, “Programming with Java - A Primer”, The Sun Micro Systems Press,  
New Delhi, ISBN 81-265-0931-7

**References:**

- 1) Deitel and Deitel, “Java How to Program”, Prentice Hall Upper Saddle River, New Jersey  
07458 (US). ISBN 0-13-034151-7
- 2) Jerry R Jackson Alan L, “Java by Example 1.2”, McClellan Publication

**B.C.A. - III (SEMESTER – V)**  
**PAPER- III (Elective II) -: Computer Graphics**

**[Max. Marks: 40**

---

**UNIT – I: INTRODUCTION**

**Geometry & Line Generation** – Introduction, Vectors, Pixels and Frames Buffers, Vector Generation, Character Generation, Displaying the Frame Buffer. **Graphics Primitive** – Introduction, Applications of Graphics, Display Devices, Primitive Operations, the Display File Interpreter, Normalized Device Coordinator, Display File Structure, Display Control, Text Line Style Primitive.

**UNIT – II: POLYGONS, TRANSFORMATIONS & SEGMENTS**

**Polygons** – Introduction, Polygons, Polygon Representation, Entering Polygon, An Inside Test, Filling Polygons. **Transformations** – Introduction, Matrices, Scaling Transformation, SIN & COS, Sum of Angles Identifier, Rotation, Homogeneous Coordinates and Translation, Rotation about an Arbitrary Point, Other Transformation, Display Procedures. **Segments** – Introduction, Segment Table, Segment Creation, Closing the Segments, Other Display File Structure, Raster Technique.

**UNIT – III: WINDOWING & 3D GEOMETRY**

**Windowing & Clipping** - Introduction, Viewing Transformation, Viewing Transformation Implementation, Clipping, Clipping of Polygons, Adding Clipping to the System, Generalized Clipping, Position Relative to an Arbitrary Line, Multiple Windowing. **Interaction** – Introduction, Hardware, Input Devices Handling Algorithms, Event Handling, Delectability Attributes, Simulating a Locator with a Pick, Pick with a Locator, Echoing, Interactive Technology. **Three Dimension Geometry** – Introduction, 3D Geometry, Primitives and Transformation, Rotation about an Arbitrary Axis, Parallel Projection, Perspective Projection, Special Projection, Viewing Parameters, and Conversation to View Plan Coordinate 3D Viewing Transformation.

**UNIT – IV: SURFACE, SHADING & CURVES**

**Hidden Surface and Lines** – Introduction, Back Face Removal, Painters Algorithm, Collection of Polygons, Remembering the Style, Hidden Surface Check. **Shading** – Introduction, Diffusion, Illustration, Point- Source Illustration, Specular Reflection, Transparency and Shadow. **Curves** – Introduction, Curve Generation, Implementation, Interpolating Polygon, B-Splines and Curves.

**Books:**

- 1) Dr. S.B.Kishor, Bharti R. Dikhit,” Computer Graphics”, Das Ganu Pub,
- 2) Steven Harrington, “Computer Graphics a Programming Approach ”, Tata McGraw-Hill,  
ISBN- 0-07-100472-6
- 3) Donald Hearn Baker,” Computer Graphics”, Pearson Education, ISBN-81-78-08-794-4

**References:**

- 1) Newman & Sproul, ”Interactive Computer Graphics “
- 2) David F Rogers, “Procedural Elements for Computer Graphics”, Tata McGraw Hill, 2nd Ed,  
ISBN-0-07-047371-4

**UNIT I: SQL SERVER ARCHITECTURE**

**SQL Server Architecture:** SQL Server Data Storage Architecture, Data Engine, System Databases. **SQL Components:** SQL's Basic Object, Data Types, Transact-SQL Functions, Scalar Operators, Null Values. Data Definition Language, Data Manipulation Language, Queries, Modification of Table Contents, Stored Procedures and User-Defined Functions

**UNIT II: SQL SERVER OVERVIEW**

**SQL Server:** SQL Server Architecture, Working with SQL Server, Overview of T-SQL, Elements T-SQL, Running T-SQL **Commands:** Creating Database, Modifying & Deleting Database, Creating, Modifying and Deleting Tables. Data Integrity, Types of Data Integrity, Using Constraints and Rules. Planning and Creating Indexes, Index Architecture.

**UNIT III: QUERY, JOINS, VIEW**

**Query :** Introduction to Queries, Nested Queries, Examples of Queries, **Joins:** Define Joins, Joining multiple tables, Joining multiple result sets, Creating table from result set , Using EXIST, NOT EXIST, IN , NOT IN, BETWEEN and other Operator. Using AGGREGATE Function, GROUP BY fundamentals, listing top values, using COUNT Keyword, **View:** View, Defining view and advantage of View, Implementing Views.

**UNIT IV: CURSOR, PROCEDURE and TRIGGERS**

**Cursors:** Cursor, Declaring, Opening, Fetching and Closing a Cursor. **Procedure:** User Defined Procedures, Creating & Executing Procedures, Stored Procedure, **Triggers:** Defining Triggers, Examples of Triggers, Implementing Triggers.

**Books:**

- 1) Dusan Pelkovic,"Microsoft SQL Server 2008, Beginner S. Guide ", TMH Pub, 1st Edition 2008, ISBN-0071540383.
- 2) Michel Lee, Gentry Bieker,"Mastering SQL Server 2008", Sybex Pub, 1st Edition, 2009, ISBN-047028904x.
- 3) Martin Gruber,"Understanding SQL", 1st Edition 1995, ISBN-81-7029-644-7.

**References:**

- 1) Robert Vieira," Beginning Microsoft SQL Server 2008 Programming", Wrox Publication, 2009, ISBN-9780470257012.

**B.C.A. - III (Semester-V)**  
**Paper-IV (Elective I): COMPUTERS FOR MANAGER**

**[Max Marks: 50]**

---

**Unit I**

History of Internet, Internet Applications, Introduction to MIS, structure of MIS, ERP, CRM, SCM.

**Unit II**

Business Intelligence, Business Analytics: Online Analytical Processing Reporting and Querying, Online Analytical Processing.

**Unit III**

Data Text Web Mining and Predictive Analytics, Text Mining, Web Mining, Predictive Analytics.

**Unit IV**

Data Visualization, Geographic Information Systems (GIS), Virtual Reality, Real-Time Business Intelligence (BI), Competitive Intelligence (CI), the Role of Scorecards and Dashboards in Performance Management.

**Books:**

1. Computer for Manager, Dr. S. B. Kishor, Dr. Niyaz Sheikh, Dr. Chitra Dhawale, Dr. Rajani Singh, Das Ganu Publication
2. System Analysis and Design, Elias. Award, Galgotha Publication 2<sup>nd</sup> Edition ISBN: 81751568-X.

**B.C.A. - III (SEMESTER – V)**

**Paper –IV (Elective II) -: A Certification Course from IIT Spoken Tutorial, Mumbai**  
**[Max. Marks: 50]**

---

**Enroll and Select any one course from IIT Spoken Tutorial, Mumbai**

**B.C.A. - III (SEMESTER – V)**  
**Paper –IV (Elective III) -: Personality Development**

**[Max Marks: 50**

---

**UNIT- I SPOKEN ENGLISH BASIC COURSE**

Improve accuracy in Grammar, Expand vocabulary, Tenses, Prepositions, Modals, Voices, Direct/Indirect Speech, Adverbs, Adjectives. **Interpersonal skills:** Introduction to Interpersonal Relations, Analysis of Life position.

**UNIT-II COMMUNICATION SKILLS**

Introduction to Communication, Flow of Communication, Listening, Barriers of Communication, How to overcome barriers of communication. **Stress Management:** Introduction to Stress Causes of Stress, Impact Management Stress, And Managing Stress.

**UNIT –III GROUP DYNAMICS &TEAM BUILDING**

Group Dynamics, Importance of groups in organization, Team Interactions in group, How to build a good team? **Personality Development:** Inner Personality Development, Role of motivation & body language, Filling the GAP- Grooming, Attitude, Personality. **Creative Thinking:** Express creativity in everyday situations, know the creative thinking process, and develop a positive attitude.

**UNIT-IV BUSINESS WRITING**

Use of Simple structure while writing, apply a positive tone in business communication. **Time Management:** Time as a Resource, Identify Important Time, Management Wasters, Techniques for better Time Management. **Motivation:** Introduction to Motivation, Relevance and types of Motivation.

**Books:**

- Vijay Agrawal ,”Personality Development for Students “, Paperback, 1<sup>st</sup> Ed<sup>n</sup> , ISBN:9789382419259,938241925X
- Sourav Das ,” The Personality Development Book”

**Reference:**

- Barun Mitra ,”Personality Development and Soft skills”, Oxford publications
- “Soft skill Development”, Sai Jyoti publications, Prashant A. Dhanwalkar, S.R.Sharma,Gunjan Sharma

**B.C.A. - III (SEMESTER – V)**  
**Paper –IV (Elective IV) -: Accounting & Office Management**

**[Max. Marks: 50**

-----  
**UNIT I: CONCEPT OF OFFICE MANAGEMENT**

Meaning and definition of office Importance of office, Functions of Modern office, Sections and function of office departments, Meanings and definitions of Management, Functions of management, Meaning and definitions of office management, Approach of office management 1) Conventional office Management 2) Artistic office management 3) Scientific office management, Principles of office management, Functions of office management.

**UNIT II: OFFICE ORGANIZING**

Meaning and definition of office organization, Importance of office organization Principles of office organization, Types of office organization, Meaning and definition of Delegation of Authority, Responsibility, Importance, features and factors of delegation of authority and responsibility, Principles of Delegation of Authority and responsibility, Problems in Delegation of Authority and responsibility, Job specialization, Job analysis and Job description, Meaning and Importance of organizational Relationship, Meaning of Span of Authority, Informal Organization, Conflict in Organization, Causes of organizational change.

**UNIT III: OFFICE COMMUNICATION**

Meaning and definition of Communication, Importance of Communication, Features of Communication, Elements of Communication, Scope of Communication, Types and Media of communication, Principles of communication, Barriers in communication, Meaning, definition and principles of coordination, Relation between coordination and communication.

**UNIT IV: OFFICE MANUALS**

Meaning and definition of office Manuals, Purpose of office manual, Importance of office Manual, Types of Office Manual, Manual in use, Contents of Office manuals, Sources of Manual materials, Procedure of preparation of Office manual, Distribution revision and maintenance of office manuals, Evaluation of Office manuals, Advantages and Disadvantages of office manual, By use & purpose, Primary memory & Secondary memory, Input and output Devices, Merit and Demerit of computer, MS – Word, Excel, PowerPoint, Meaning, Applications Features Merit and Demerit, Introduction of Internet, Email- Creating receiving & sending Email.

**Books**

- 1) Introduction to Computers, Dr Darrell W Hajek, ISBN-10: 1545236461
- 2) Bank Financial Management, Indian Institute of Banking and Finance, McMillan Education Publication

**B.C.A. - III (SEMESTER – V)**  
**Practical Lab based on (DSEC-I)**

**[Max. Marks: 50]**

---

- 1) Write a JavaScript to find absolute number.
- 2) Write a JavaScript to Demonstration of Type of Operand.
- 3) Write a JavaScript to check whether entered number is Positive or Negative or Zero.
- 4) Write a JavaScript code to demonstrate to switch case.
- 5) Write a JavaScript to find the sum of first N natural numbers
- 6) Write a JavaScript to find sum of each digit of a number.
- 7) Write a JavaScript to demonstrate of Array objects for accepting and displaying list of names in descending order.
- 8) Write a JavaScript to Check entered String is palindrome or not.
- 9) Write JavaScript to demonstrate a Date Objects for displaying current day and check current year is leap or not.
- 10) Write a JavaScript to demonstration of eval function.
- 11) Design a program for displaying marks and percentage of student in JavaScript using event handling.
- 12) Write a Vbscript program to find the factorial of given number.
- 13) Write a Vbscript to demonstrate the program to find largest among two numbers.
- 14) Write Vbscript to create dialog boxes.
- 15) Demonstration of array in Vbscript.



**B.C.A. - III (SEMESTER – V)**  
**Practical Lab based on (DSEC-III)**

**[Max. Marks: 50**

---

- 1) Write a Program to display “Hello World” on to the console.
- 2) Write a Program to create a class which contains two methods with the same name but with different method signature.(method overloading)
- 3) Write a Program to exhibit method overriding where calculate () method of super class is overridden by the calculate () method of subclass.
- 4) Write a Program to use super class reference to call calculate () method.
- 5) Write a Program to explain the concept of constructor and parameterized constructor.
- 6) Write a Program to explain the concept of inheritance.
- 7) Write a Program to access the super class method and instance variable by using super key from subclass.
- 8) Write a Program to prove that the default constructor of the super class is available to subclass by default.
- 9) Write a Program to create an abstract class with an abstract method and then create a concrete class which provides the implementation to abstract methods of abstract class.
- 10) Write a Program to implement multiple interfaces simultaneously.
- 11) Write a program to explain the concept of ‘this’ keyword.
- 12) Write a program to create a thread and explain the use of the methods run () and start ().
- 13) Write a program to create an Applet and uses all the methods of Applets class.
- 14) Write a program to create a Frame and has a button that response to the users action. (Tip: create a class that extends Action Listener).
- 15) Write a program to explain any one of the layout machines used in Java.
- 16) Write a program to bypass the generated exception from present method to the caller method by using throws keyword.
- 17) Write a program to develop an applet to print the life cycle methods of applet on the HTML page.

**B.C.A. - III (SEMESTER – V)**  
**Practical Lab based on (DSEC-III)**

**[Max. Marks: 50]**

---

- 1) Write a program for vector generation line algorithm.
- 2) Write a program for generating line by using Bresenham algorithm.
- 3) Write a program for draw the house.
- 4) Write program to fill the rectangle
- 5) Write a program to draw a Circle.
- 6) Write a program to draw an N-sided polygon.
- 7) Write a program to draw an Arc.
- 8) Write program to draw an angle theta.
- 9) Write a program to draw a Bezier Curve.
- 10) Write program to rotate line segment by an angle.
- 11) Write program to translate the line.
- 12) Write a program to scaling the image.
- 13) Write a program to shearing the image.
- 14) Write a program to draw a parabola using formula
- 15) Write a program to draw an ellipse using formula.
- 16) Write a program to draw a hyperbola using formula.

**B.C.A. - III (SEMESTER – V)**  
**Paper -VIII:- Seminar (Skill Based)**

**[Max. Marks: 100**

---

The seminar must be based on some current trends related to IT / Computer Science / Computer Application. A Student must present the Power Point presentation along with Seminar Report. Students are requested to follow the following guidelines while choosing & preparing their seminars.

Guide lines to B.C.A. Seminar

- 1) Name of seminar topic must be latest to the current trends and should not be repeated but can be extended from previous semester.
- 2) Seminar topic is to be approved by the concerned guide before the deadline prescribed by university time-table.
- 3) Seminar should be given individually.
- 4) Students are allowed to use graphics / animation / audio-video aids for their presentation.
- 5) Seminar work comprised of ONLY Internal examination.
- 6) Students are requested to submit their seminar reports on or before the dead line with the concern of their respective guide otherwise students will be responsible for any appropriate action.
- 7) Seminar Report should be typed / printed in double line space using A4 size bond papers with a left margin of 1.5”and right margin of 1.0” with proper spiral binding to be done.
- 8) Students are requested to obtain necessary certificates and declaration to be duly enclosed in the report.

## BCA III (Semester VI)

| Subject  | Paper Code | Paper Name  | Total Period# /Week | Credit    | % of Assessment |            |            |                    |
|--|------------|---|---------------------|-----------|-----------------|------------|------------|--------------------|
|  |            |   |                     |           | IA              | UE         | Total      | Min. Passing (40%) |
| Discipline Specific Elective Course (DSEC-VI)      | UBCAT601.1 | (Select Any 2)<br>• .NET & C#. NET<br>• Computer Forensic Science<br>• Database Administration & Distributed Computing              | 3                   | 2         | 10              | 40         | 50         | 40                 |
|  | UBCAT601.2 |   | 3                   | 2         | 10              | 40         | 50         |                    |
| Discipline Specific Course (DSEC-I)                | UBCAP602   | Project   | 4 Prac. Per Batch   | 4         | 20              | 80         | 100        | 40                 |
| Discipline Specific Elective Course (DSEC-VII)     | UBCAT603.1 | (Select Any 2)<br>1) Advance JAVA<br>2) Computational Linguistics<br>3) Image Processing & Analysis<br>4) Project Management        | 3                   | 2         | 10              | 40         | 50         | 40                 |
|  | UBCAT603.2 |   | 3                   | 2         | 10              | 40         | 50         |                    |
| Skill Enhancement Course (SEC-IV)                  | UBCAT604.1 | (Select Any One)<br>3) Media Management<br>• A Certification Course from MOOC<br>• E- Waste Management<br>• Principle Of Management | 1                   | 2         | 50              | --         | 50         | 20                 |
|  | UBCAT604.2 |   | 1                   | 2         | 50              | --         | 50         |                    |
| Discipline Specific Elective Course (DSEC-VIII)    | UBCAP605   | Lab Based on (DSEC-VI)  | 4 Prac. Per Batch   | 2         | 20              | 30         | 50         | 20                 |
| Discipline Specific Elective Course (DSEC-IX)      | UBCAS606   | Lab Based on (DSEC-VII)   | 4 Prac. Per Batch   | 2         | 20              | 30         | 50         | 20                 |
| Ability Enhancement Compulsory Courses (ACCC-VIII) | UBCAS607   | Project Based Seminar   | 3                   | 4         | 100             | --         | 100        | 40                 |
| <b>Total</b>                                       |            |   |                     | <b>22</b> | <b>250</b>      | <b>300</b> | <b>550</b> | <b>220</b>         |

**Note:-1) In a Group, if any student remains absent in one of the paper then candidate result will be considered as fail in that group even though he/she has scored minimum passing marks in other paper of that group. Candidate need to appear in both the papers of that group.**

**2) In Practical/Project student must appear External Practical Exam conducted by University in order to clear practical/Project exam.**

(Select Any Two)  
**B.C.A. - III (SEMESTER – VI)**  
**PAPER- I (Elective I) –: .NET & C#. NET**

**[Max. Marks: 40**

---

**UNIT I: .NET FRAMEWORK**

**.NET Framework :** Basic of .NET Framework, Common Type System, Common Language Specification, Common Language Runtime, Understanding Assemblies, Working with Base-Class Library, Elements of Visual Basic .NET, Declaring Variables, Type Conversion, Conditionals and Loops, Procedures, Functions, Exception Handling.

**UNIT II: WINDOWS FORMS AND CONTROLS**

**Windows Forms and Controls:** All about windows Forms, Adding controls to Forms, Handling Events, MsgBox Function, InputBox Function, Text Boxes, Rich Text Boxes, Labels, Buttons, Checkboxes, Radio Buttons, List Boxes, Combo Boxes, Picture Boxes, and Menus.

**UNIT III: C# PROGRAMMING**

**C# Programming :** Evolution of C#, Characteristics of C#, How C# differs from C++ & Java, A simple C# program, Namespaces, Multiple Main Methods, Data Types, Boxing and Unboxing, Declaring Methods, The Main Method, Invoking Methods, Method Parameters, Pass by Value, Pass by Reference, The Output Parameters, Variable Argument Lists, Method Overloading, System Array class, Array List class.

**UNIT IV: MANIPULATING STRINGS & CLASSES AND OBJECTS**

**Manipulating Strings & Classes and Objects :**String Methods, Inserting Strings, Comparing Strings, Finding Substrings, Mutable Strings, Array of Strings, Defining a Class, Creating Objects, Accessing Class members, Static Constructors, Private Constructor, The 'this' Reference, Read-only Members, Properties, Overriding Methods, Abstract Classes, Abstract Methods, Sealed Classes, Sealed Methods

**Books:**

- 1) E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2004.
- 3) Jeffrey R. Shapiro, "The Complete References: Visual Basic .NET", Tata Mcgraw-Hill, 2002.
- 4)

**References:**

- 1) Andrew Troelsen, "C# and the .Net Platform", Press, 2003.
- 2) S. ThamaraiSelvi, R. Murugesan, "A Textbook on C# ", Pearson, 2003.

**B.C.A. - III (SEMESTER – VI)**  
**PAPER- I (Elective II) –: Computer Forensic Science**

**[Max. Marks: 40**

---

**UNIT I: INTERNET CRIME**

**Internet Crime:** Internet Crime: Definition, Types of Internet Crime, Hacking and Cracking, Cyber Terrorism, Child Pornography, Stalking, Cyber Theft, Cyber Fraud, Phishing, Password Cracking, Evidence Collection, Email Tracing, Internet Fraud.

**UNIT III: CRYPTOGRAPHY**

**Cryptography :** Cryptography: Encryption, Decryption, Encryption Techniques, Cipher Principles, Data Encryption Standard, Block Cipher Design, Principles and Modes of Operation, Public Key, Private Key, Domain Name, Steganography, Network Security.

**UNIT II: SECURITY**

**Security :** Authentication: Requirements, Authentication Function, Message Authentication Codes, Hash Functions, Security of Hash Functions, Secure Hash Algorithm, Digital Signatures, Authentication Protocols , Digital Signature Standard, Electronic Signature, Biometric, Intrusion Detection Password Management, Viruses and Related Threat, Virus Counter Measure, Firewall Design Principles, Trusted Systems.

**UNIT IV: CYBER LAW**

**Cyber Law: Cyber Law:** Introduction, Definition of Cyber Law, Legal Identity, IT ACT: History of Information Technology Act 2000; IT Act and E-Mail, Copyright, Patent, Trade Marks.

**Books:**

- 1) Vakul Sharma, “Handbook of Cyber Laws “, McMillan ISBN 0333-93817-8.
- 2) Kamesh Agarwala, Murli D. Tiwari, “IT and Indian Legal System”, McMillan, ISBN 9780333 937921.
- 3) William Stallings “Cryptography and Network Security”, Pearson, 4th Edition, ISBN 978-81-775-8774-6.

**References:**

- 1) William Stallings, “Cryptography and Network Security Principles and Practices” Pearson, 4th Edition, ISBN 81-7758-774-9.
- 2) William Stallings, “Network Security Essentials Application and Standards”, Pearson, 4th Edition, ISBN 978-81-317-6175-5.

---

**UNIT-I: INTRODUCTION TO ORACLE DATABASE ADMINISTRATION**

**Oracle Database Administration :** Introduction to Relational Database Management System, Database Modeling and Relational Database Design, Creating Database, Background Processes, Internal Database Structure, Database File Layout, Database Space Usage Overview, Resizing Data File. Basic SQL and PL/SQL Concepts Terminology, Using Procedure Builders, Data Manipulation Language (DML), Data Definition Language (DDL), PL/SQL Programming.

**UNIT-II: ORACLE DATABASE ARCHITECTURE AND ADMINISTRATION**

**Database Architecture and Administration:** Oracle Database Architecture, Design, Creation, Management of Oracle Database and Related Database Schemes, Data Dictionary Views, Maintaining the Control, Redo Log Files, Managing Tables Spaces and Data Files, Storage Structure and Relationships, Managing Tables, Indexes, Managing Data Integrity, Managing Password Security and Resources, Managing Users, Privileges, Roles.

**UNIT-III: FUNDAMENTALS OF DISTRIBUTED COMPUTING**

**Fundamentals of Distributed Computing:** Introduction to Distributed Computing System, Distributed Computing System Model, Advantages of Distributed Computing System, Introduction to Distributed Operating System, Introduction to Distributed Computing Environment.

**UNIT-IV: MESSAGE PASSING**

**Message Passing:** Introduction, Characteristics of Good Message Passing System, Issues in IPC by Message Passing, Synchronization, Buffering, Multidatagram Messages, Encoding and Decoding of Message Data Process Addressing, Failure Handling, Group Communication.

**Books:**

- 1.) Oracle Press, “ORACLE DBA Handbook”, Tata McGraw Hill Pub, ISBN-978-0-07-048674-7
- 2) Groff Weinberg, “The Complete reference SQL”, Tata McGraw Hill Pub, ISBN-978-0-07-052850-5

**References:**

- 1) P.K .Sinha, “Distributed Operating System”, PHI publication, ISBN-8120313801
- 2) Martin Gruber, “Understanding SQL”, BPB Pub, ISBN-81-7029-644-7

### **Instruction**

Towards the end of the second semester of study, a student will be examined in the course “**Project Work**”.

- A. Project Work may be done individually or in groups (**Maximum 3 students**) in case of bigger projects. However if project is done in groups, each student must be given a responsibility for a distinct module and care should be taken to monitor the progress of individual student.
- B. The Project Work should be done using the tools covered in **B.C.A**
- C. The Project Work should be of such a nature that it could prove useful or be relevant from the System-oriented/Application/commercial / management angle.
- D. The project work will carry 100 marks.
- E. The external viva-voce examination for Project Work would be held as per the Examination Time Table of the second year of study, by a panel of one external and one internal examiner.

### **Types of Project**

The Applications Areas of project - Financial/Marketing/Database Management System/ Relational Database Management System/E-Commerce /Internet/ Manufacturing/ web Designing/Hardware and Software interaction based etc.

#### Project Proposal (Synopsis)

The project proposal should be prepared in consultation with the guide. The project guide must be a person having minimum Qualification MCA/M.Sc. (Computer)/ M.Sc. (IT/ Math's/Electronics/Statistics/Physics + Post B.Sc. Dip. In Comp. Sc. & Appl.)

The project proposal should clearly state the objectives and environment of the proposed project to be undertaken. It should have full details in the following form:

1. Title of the Project
2. Objectives and Hypothesis of the Project
3. Project Category (DBMS/RDBMS/OOPS/Web Designing/Internet etc.)
4. Tools/Platform, Languages to be used
5. A complete Structure of the program:
  - i. Analysis.
  - ii. Numbers of Modules.
  - iii. Data Structures or Tables
  - iv. Process Logic.
  - v. Types of Report Generation.



6. Scope of future Application.

**Project Report Formulation:**

1. Title Page.

2. Certificate Page.

3. Declaration Page.

4. Acknowledgment Page.

5. Index or Content Page.

6. Documentation.

i. Introduction/Objectives.

ii. Preliminary System Analysis.

iii. Software Requirement Specification.

iv. System Design.

v. Source Code.

vi. Input screen & Output Screen.

vii. Features of Project and its Limitations

viii. Security Measures taken.

ix. Future Scope of the project.

x. Bibliography

**B.C.A. - III (SEMESTER – VI)**  
**PAPER- III (Elective I) –: Advance JAVA**

**[Max. Marks: 40**

---

**UNIT I: AWT & SWING**

**AWT:** Working with Windows, Controls, Layout Manager, and Menus. **Swings:** Introduction of Swings and Event Handling, Working with 2D Basic Shapes, Java API, Using Color, Using Font, Displaying Images.

**Collections:** Introduction to The Collection Framework (Interfaces, Implementation and Algorithms), Interfaces, **Collection Classes:** Set, List, Queue and Map. **Set:** Hash set, Tree set, and Linked hash Set, Interfaces Such As Lists, Set, Vectors, Linked list, Comparator, Hash, Tables.

**UNIT II: JDBC**

**Overview:** JDBC-ODBC Bridge, Java SQL Package and JDBC Related Classes, Architecture of JDBC Application, Interface of JDBC, Types of Driver, Creating C-S Application Using JDBC Oracle/Access Databases.

**UNIT III: SERVLETS**

**Introduction of Servlet:** Servlet Methods, Generics Servlets, Httpservlets , Methods of Httpservlets Class, Httpservlets request, Httpservlets response, doGet and doPost Method, Cookies, Methods of Class Cookies, Session Tracking, C-S Application Using Servlets.

**UNIT -IV: NETWORKING**

**JSP:** Getting Familiar with JSP Server, First JSP, Adding Dynamic Contents via Expressions Scriptlets, Mixing Scriptlets and HTML, Directives, Declaration, Tags and Session. **URL:** URL Connection, Socket, Loading from URL, Reading through URL, Chat Server, and Server Portion of C-S Stream Socket, Demonstration Client and Server Side, C-S Applications.

**Books:**

- 1) Diel, “Java How to Program”, Pearson Education Inc, “6th Edition”, Year- 2007, ISBN No- 81-317-0954-X
- 2) Herbert Schield, “Java2 Complete Reference”, Tata McGraw Hill, “7th Edition”, Year- 2007, ISBN No- 0-07-063677-X

**Reference:**

- 1) Jason Hunter, William Crawford, “Java Servlet Programming”, O'Reilly Media Inc., “2th Edition”, ISBN No- 059600040

**UNIT I: INTRODUCTION TO PROLOG**

**Introduction to Prolog :** Introduction to Prolog, Converting English to Prolog facts and Rules, Goals, Prolog Terminology, Matching in Prolog, Cut, Backtracking, Fail, Recursion, Lists and Control Structure.

**Introduction to A.I. -** Definition of AI, AI Technique, Tic-Tact-Toe, Level of the Model, Criteria for Success, Problems and Problems Spaces, Defining the Problem.

**UNIT II: PROBLEM SOLVING**

**Problem Solving :** Problem Characteristic, State Space Search, Production Systems, Control Strategies, Depth-First, Breadth-First Search, Production System Characteristics, Issues in Design of Search Programs.

**Heuristic Search:** Hill Climbing, Best-First Search, Problem Reduction, Constraint Satisfaction, Means-Ends Analysis.

**UNIT III: KNOWLEDGE REPRESENTATION**

**Knowledge Representation :** Representation and Mapping, Approaches to Knowledge Representation, Issues in Knowledge Representation, Representing Simple Facts in Logic, Conversion to Clause Form, Basis of Resolution, Resolution in Propositional Logic, Resolution in Predicative Logic, Unification Algorithm.

**Representing Knowledge using Rules:** Declarative Knowledge, Forward versus Backward Reasoning, Matching, and Control Knowledge.

**UNIT IV: NATURAL LANGUAGE UNDERSTANDING**

**Natural Language Understanding :** Concept of Understanding, Natural Language Processing Introduction, Steps in the Process, Syntactic Analysis, Semantic Analysis, Discourse and Pragmatic Processing, Statistical Natural Language Processing, Spell Checking, Pattern Recognition. **Learning:** Learning Introduction, Rote Learning, Learning in Problem Solving, Discovery, Analogy, Formal Learning Theory.

**Books:**

- 1) Rich, Knight, Nair, “Artificial Intelligence”, TMH, 3<sup>rd</sup> Ed, ISBN 9780070087705
- 2) Dan W Patterson “Introduction to Artificial Intelligence and Expert Systems”, PHI, ISBN-8120307771
- 3) NJ Nilsson, “Principles of AI”, Narosa Pub. House, 1990, ISBN-8185198292

**References:**

- 3) Peter Jackson, “Introduction to Expert Systems”, AWP, MA, 1992
- 4) RJ Schalkoff, “Artificial Intelligence - an Engineering Approach”, McGraw Hill Int Ed, Singapore, 1992

**UNIT –I: DIGITAL IMAGE INTRODUCTION**

**Introduction:** Motivation and Perspective, Scenes and Images, Application: Components of Image Processing System. **Visual Preliminaries:** Brightness Adaptation and Contrast- Acuity and Contour, Texture and Pattern Discrimination, Shape Detection and Recognition- Perception of Color. **Image Formation:** Geometric Model, Basic Transformations, Perspective Projection, Camera Calibration- Photometric Model. **Digitization:** Sampling, Quantization, Visual Detail in the Digital Image, Digital Image, Elements of Digital Geometry.

**UNIT-II: IMAGE PROCESSING ENHANCEMENT**

**Image Enhancement:** Contrast Intensification, Smoothing, Image Averaging, Mean Filter, Ordered Statistic Filter, Edge Preserving Smoothing, Low Pass Filtering, Image Sharpening, High, Pass Filtering, Homomorphic Filtering. **Restoration:** Minimum Mean Square Error Restoration, Least Square Error Restoration Constrained, Least Square Error Restoration.

**UNIT-III: IMAGE COMPRESSION**

**Error Criterion:** Lossy Compression methods, loss –less compression, Huffman coding, Run length coding-Block coding, Quad Tree coding- contour coding. **Registration:** Geometric Transformation, Plane to Plane Transformation. **Multi-Valued Image Processing:** Processing of color Images, Processing of Satellite Image, and Medical Image Processing. **Segmentation:** Region Extraction-Pixel based Approach, Feature Thresholding, Optimum Threshold, Threshold Selection Methods, Multi-level Thresholding, and Local Thresholding.

**UNIT-IV: IMAGE ANALYSIS AND FEATURE EXTRACTION EDGE AND LINE DETECTION**

**Edge Detection,** Derivation operators, Pattern Filling Approach, Morphologic Edge Detection, Edge Linking and Edge Following, Edge elements Extraction by Thresholding, Edge Detector Performance, Line Detection, and Corner Detection. **Recognition:** Deterministic Methods, Clustering, Statistical Classification, Mathematical Recognition, Syntactic Recognition, Grammar, Recognition Strategy, Tree search, Graph Matching.

**Books:**

- 1) B. Chand and D. Dutta Majumder, Digital Image Processing and analysis, PHI (2001), ISBN-81-203-1618-5
- 2) Milan Sonka, "Image Processing Analysis and Machine Vision", PWS Pub.2nd Ed. ISBN-81-315-0300-3

**References:**

- 1) Adrian Low, Computer vision and Image Processing, McGraw Hill (1991)
- 2) Kenneth R. Castle man, Digital Image Processing, PHI

**B.C.A. - III (SEMESTER – VI)**  
**PAPER –III (Elective IV) -: Project Management**  
**[Max Marks: 40]**

---

**UNIT- I: PROJECT MANAGEMENT**

**Project Management** : Management Spectrum, the People, the Product, the Process, the Project, Project Manager-Role and Responsibilities, Project Estimation – Introduction, Decomposition Techniques-Software Sizing, Problem Based Estimation, Loc Based, FP Based Estimation.

**UNIT – II: PROJECT SCHEDULING**

**Project Scheduling:** Basic Concepts, Project Scheduling, Basic Principles, Relationship between People and Effort, Effort, Effort Distribution, Definition A Task Network- CPM/PERT, Gantt chart.

**UNIT –III: MICROSOFT PROJECT**

**Microsoft Project** : Introduction Microsoft Project, Menu Bar, Using the Toolbars: Using Tool Tips, Using the Standard Toolbar, Using the Formatting Toolbar, Open, Save, Save as Views, Changing to Calendar View, Changing the Look of the Calendar – (for Printing).Using the Gantt Chart View: Opening the Gantt Chart View, Using the Components of the Gantt Chart View, Moving the Border Between the Panes., Understanding the Project Information: Starting a New Project, Using the Project Information, Window.

**UNIT – IV: ADVANCED MICROSOFT PROJECT**

**Advanced Microsoft Project:** Understanding the Project Calendar: Setting up a Working Calendar, Using Default, Working Time, Creating a New Calendar, Changing Default Working Time Changing Time for, Individual Days, Entering a Shut-Down Period, Linking Your New Calendar to the Project, Understanding File Properties: Understanding Properties, Examining Properties, Using Save and Save as: Saving and Saving as, Saving a Project for the First Time, Saving for Future Up-Dates to the Project.

**Books:**

- 1) Elias M. Award, “System Analysis and Design”, Galgotia Publication
- 2) Newton,” Project Management Step By Step“, Pearson Publication, ISBN-9788131719152
- 3) Maylor ,” Project Management”, 3rd Ed., Pearson Pub., ISBN-9788177580365.

**References:**

- 1) Whiteen, Bentley, Dittman, “System Analysis and Design Methods”, McGraw-Hill
- 2) Royce,” Software Project Management”, Pearson Publ., ISBN- 978177583786

(Select Any ONE)

**B.C.A. - III (SEMESTER – VI)**  
**PAPER- IV (Elective I) –: Media Management**

**[Max. Marks: 50**

---

**UNIT- II: PRINCIPLES OF MEDIA MANAGEMENT**

Principles of media management and their significance. Media as an industry and profession.

**UNIT- II: OWNERSHIP**

Ownership patterns of mass-media in India: sole proprietorship, partnership, private limited companies, Public limited companies, trusts, co-operatives, religious institutions (societies) and franchises (chains).

**UNIT –III: INDIAN MEDIA**

Foreign equity in Indian media (including print media) and Press Commissions on Indian newspaper. Management structure, Organizational structure. Functions of different departments: General Administration, Editorial, Finance.

**UNIT- IV: CIRCULATION AND MARKETING**

Circulation (sales promotion), Marketing (Advertising), Human Resource and Production. Economics of print and electronic media.

**BOOKS:**

1. Media Management: Leveraging Content for Profitable Growth Andrej Vizjak, Max Josef Ringlstetter Springer Science & Business Media, 10-Dec-2002 Scott Basham, "Pagemaker in Easy Steps", Dream Tech, ISBN: 978-81-7722-0001
2. Kogent Learning Solution, "Corel Draw in Easy Steps", Dream Tech ISBN: 978-81-7722-960-8
3. "Photoshop in Easy Steps", Kogent Learning Solution, Dream Tech ISBN: 978-93-5004-078-2

**Enroll and Select any one course from Certification Course from MOOC**

**UNIT – I SOURCES, COMPOSITION AND CHARACTERISTIC**

Sources, Composition and characteristic of hazardous waste, Hazardous Waste (Management and Handling) Rules, 1989 and amendments, Federal Hazardous Waste Regulations under RCRA, Superfund, CERCLA and SARA. Toxicology, public health impact, Protocols, issues and challenges in transportation of hazardous waste.

**UNIT – II CHARACTERIZATION OF MEDICAL WASTE**

Characterization of medical waste- Bio-medical wastes (Management and Handling) Rules, 1998, Amendments and guidelines, segregation, packaging, storage, transport of infectious waste. Techniques of Bio-medical waste management. Health and safety rules. Protocols, issues and challenges in transportation of Biomedical waste.

**UNIT – III TREATMENT METHOD**

Treatment method- Autoclave, Hydroclave, Microwave, Chemical Disinfection, Solidification and stabilization, Bioremediation, Thermal Conversion Technologies, accumulation and storage of hazardous waste, land disposal of hazardous waste, other treatment and disposal method. Common Hazardous Waste Treatment facilities (TSDF).

**UNIT – IV E-WASTE**

E-waste: Introduction, toxicity due to hazardous substances in e-waste and their impacts, domestic e-waste disposal, e-waste management, technologies for recovery of resource from electronic waste, guidelines for environmentally sound management of e-waste, occupational and environmental health perspectives of recycling e-waste in India.

**Books:**

1. Tchobanoglous G., Theisen H., Viquel S.A., “Integrated Solid Waste Management: Engineering, Principles and Management issues”, Tata McGraw Hill Publishing Company Ltd., New Delhi.
2. CPHEEO Manual on Municipal Solid Waste Management.

**Reference Books:**

1. Peavy H.S., Rowe D.R., Tchobanoglous G., “Environmental Engineering”, Tata McGraw Hill Publishing Company Ltd., New Delhi.
2. Cunningham W.P., Cunningham M.A., “Principles of Environmental Science”, Tata McGraw Hill Publishing Company Ltd., New Delhi.
3. Johri R., “E-waste: implications, regulations, and management in India and current global best practices”, TERI Press, New Delhi.
4. [R4] Krishnamoorthy B., “Environmental Management, Text Book and Cases”, PHI Learning (P) Ltd., New Delhi.



**B.C.A. - III (SEMESTER-VI)**  
**Paper-VI (Elective IV): Principle of Management**

**[Max Marks: 50]**

---

**Unit-I: Nature of Management**

Meaning, Definition, Nature, Purpose, Importance and functions. Management as an Art, Science & Profession- Management as Social System Concepts of Management- Administration - Organization.

**Unit-II: Evaluation of management**

Contribution of F.W.Taylor, Henry Fayol, Elton Mayo chester Barhard and Peter Drucker to the management (i.e School of management thought) Indian Management Thought.

**Unit-III: Functions of Management**

Planning: Meaning, Need and Importance, Types, Levels, Advantages & Limitations. Forecasting – Need & Techniques, Decision-making: Types- process rational decision making and techniques of decision making. Organizing: Elements of Organizing and Processes. Types of Organizations, Delegation of authority. Need difficulties in delegation Decentralization.

**Unit-IV: Recent Trends in Management:**

Social Responsibility of environment friendly Management. Management of Change, Management of Crisis, Total Quality Management, Stress Management, International Management.

**Books Recommended**

1. Essentials of Management – Horold Koontz and ItenizWeibrich –McGraw-Hill’s International
2. Management Theory and Practice- J. N. Chandan
3. Principal of Management – S. B. Kishor, Das GanuPrakashan
4. Essential of Business Administration – K. Aswathapa Himalaya Publishing House
5. Principles and Practice of Management- Dr. L.M. Prasad, Sultan chand a & Sons – New Delhi
6. Principles of Management ByTripathi and Reddy- Tata McGraw Hill

1. Write a program in C# to check whether given program is even or odd.
2. Write a program in C# to swap two numbers.
3. Write a program in C# to check whether the entered number is leap year or not.
4. Write a program in C# to display ATM transactions.
5. Write a program in C# to find a number using Pythagoras theorem
6. Write C# code to declare a variable to store the age of a person.
7. Write C# code to display the asterisk pattern as shown below:

```
*****  
*****  
*****  
*****  
*****
```

8. Write a C# program that prompts the user to input three integer values and find the greatest value of the three values.
9. Write a C# program that determines a student's grade.
10. Write C# program to print the table of characters that are equivalent to the ASCII codes from 1 to 122.
11. Write a program in C# to create a function to input a string and count number of spaces are in the string.
12. Write a program in C# to calculate the sum of elements in an array.
13. Write programs using conditional statements and loops:
  - i. Generate Fibonacci series.
  - ii. Generate various patterns (triangles, diamond and other patterns) with numbers.
  - iii. Test for prime numbers.
  - iv. Generate prime numbers.
  - v. Reverse a number and find sum of digits of a number.
  - vi. Test for vowels.
  - vii. Use of for each loop with arrays.
14. Object oriented programs with C#
  - a) Program using classes.
  - b) Program with different features of C#
    - i. Operator Overloading
    - ii. Inheritance (all types)
    - iii. Interfaces
    - iv. Using Delegates and events.
15. Write program to demonstrate exception handling.

1. Write a program to create Employee Table using Statement Interface.
2. Write a program to insert a record in employee table by using Statement Interface.
3. Write a program to insert multiple records according to user's choice in employee table using Statement Interface.
4. Write a program to display all employee records using Result set.
5. Write a program to delete the record using Statement Interface.
6. Write a program for Multiple Insertion using prepares statement.
7. Write a program to update a record using prepares Statement.
8. Write a program to establish the connection between java and Oracle by using jdbc-odbc bridge driver.
9. Write a program to display all updated employee records using Result set.
10. Write a program to design Web Application by using HttpServlet to display "Welcome to Servlet" message.
11. Write a program to design a Web Application by using Generic Servlet to display "Hello" message.
12. Write a program to design Http Servlet web application using do Get method to accept two numbers and perform Addition and Subtraction.
13. Write a program to design Web Application by using Cookies (Having do Get and do get methods).
14. Write a program in which Client Program communicate with server program (Using Networking concept)
15. Write a Java application which accept student name, roll no and sub1, sub2, marks and calculate total marks. Design Frame with Components and event driven program.
16. Write a program to send message from server to client.

1. How to fill color in the image in Photoshop.
2. How to change background color of the image in Photoshop.
3. How to set image in background of the image in Photoshop.
4. How to use liquefy filter in Photoshop.
5. How to use lasso tool in Photoshop.
6. Process in Photoshop to cut image and copy the image by using Alt +Left click mouse.
7. How to use painting in Photoshop.
8. How to adjust mid tone using Photoshop curves panel.
9. How to experiment with 3D Photoshop files.
10. How to create clipping paths in Photoshop.
11. How to use the clone stamp tool in Photoshop.
12. How to use puppet wrap tool in Photoshop.

The seminar must be based on the Project Topic choose by him/her. A Student must present the Power Point presentation along with Seminar Report. Students are requested to follow the following guidelines while choosing & preparing their seminars.

**Guide lines to B.C.A Seminar**

- 1) Seminar must be of the Project Topic and should not be repeated.
- 2) Seminar topic is to be approved by the concerned guide before the deadline prescribed by university timetable.
- 3) Seminar should be given individually.
- 4) Students are allowed to use graphics / animation / audio-video aids for their presentation.
- 5) Seminar work comprised of ONLY Internal examination.
- 6) Students are requested to submit their seminar reports on or before the dead line with the concern of their respective guide otherwise students will be responsible for any appropriate action.
- 7) Seminar Report should be typed / printed in double line space using A4 size bond papers with a left margin of 1.5”and right margin of 1.0” with proper spiral binding to be done.
- 8) Students are requested to obtain necessary certificates and declaration to be duly enclosed in the report.