

Syllabus of
BCA III
(Bachelor of Computer Application)
Semester-VI

Designed by Dr. S.B. Kishor



**GONDWANA UNIVERSITY,
GADCHIROLI**

SESSION 2014-2015

BCA –III

SEM VI

Paper 1	Database Administration & Distributed Computing	Theory : 80 Marks Internal : 20 Marks	Practical : 50 Marks
Paper 2	Image Processing and Analysis	Theory : 80 Marks Internal : 20 Marks	
Paper 3	Java	Theory : 80 Marks Internal : 20 Marks	Practical : 50 Marks
Paper 4	Project	Internal: 50 Marks External : 50 Marks	Total Project Marks: 100

BCA –III (Semester – VI)

Paper – I :Database Administration & Distributed Computing

Paper – II :Image Processing and Analysis

Paper – III :Java

Paper – IV : Project

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SEMESTER-VI

PAPER-I: DATABASE ADMINISTRATION & DISTRIBUTED COMPUTING [Marks: 80

UNIT-I: Introduction to 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, Verification of I/O Estimate, 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

Oracle Database Architecture, Design, Creation, Migration and Management of Oracle Database and Related Database Schemes, Data Dictionary Views and Standard Packages, 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

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

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

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SEMESTER -VI

PAPER -II: IMAGE PROCESSING AND ANALYSIS

[Marks : 80

(6BCA2)

UNIT –I: Digital Image

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

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, Restoration by Singular Value Decomposition- Restoration by Maximum A Posterior Estimation, Restoration by Homomorphic Filtering.

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, Mapping Problem in Discrete Domain –Stereo Imaging Algorithms.

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, Local Thresholding, Region based Approach.

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, Corner Detection.

Representation: Topological Attributes, Geometrical Attributes, Some other Properties, Description, - Boundary based Description-Region based Description-Relationship.

Recognition: Deterministic Methods, Clustering, Statistical Classification, Fuzzy 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. Castleman, Digital Image Processing, PHI

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SEMESTER - VI

PAPER - III: JAVA [Marks: 80

(6BCA3)

UNIT – I: Introduction to Java

History of Java, Features of Java, JDK Environment, Java Virtual Machine, Garbage Collection

Programming Concepts of Basic Java: Identifiers and Keywords, Data Types in Java, Java coding Conventions, Expressions in Java, Control structures, decision making statements, Arrays and its methods

UNIT – II: Objects and Classes

Object Fundamentals, Pass by value, ‘this’ reference, Data Hiding and Encapsulation, Overloading, Overriding Constructors, Finalization, Subclasses (Inheritance), Relationship between super class object and subclass object, implicit subclass object to super class object Conversion, Dynamic method dispatch.

Language Features: Scope rules, Static data, Static methods, Static blocks, Modifiers of Class, Method, Data Members and Variable, Abstract Classes, Interfaces, Packages, Importing Packages and Classes, User define packages.

UNIT – III: Exception Handling & Multithreading

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, Thread synchronization.

UNIT – IV: Abstract Window Toolkit & Streams and File I/O

Abstract Window Toolkit: Components and Graphics, Containers, Frames and Panels, Layout Managers-Border Layout, Flow Layout, Grid Layout, Card Layout, AWT all Components, Event Delegation Model, Event Source and Handlers, Event Categories, Listeners, Adapters-Anonymous Classes, Applets-Applet Life Cycle, Applet Context, Inter applet communication.

Streams and File IO: Files and Stream, Stream classes, Reader Writer classes, File class Tests and Utilities, Serialization and de serialization.

Books:

- 1) Cay S Horstmann Gary Cornell, “Core JAVA 2 Vol -1, 2”, The Sun Micro Systems Press, New Delhi, *ISBN-13: 978-0470105559*
- 2) Peter Van der Liden, “Just Java”, The Sun Micro Systems Press, New Delhi, *ISBN, 0130897930*
- 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

BCA- III
SEMESTER-VI
PROJECT
(6BCA4)

Instruction:

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

The project proposal should be prepared in consultation with the guide. The project guide must be a person having a regular university approval or in accordance with University guidelines.

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 the Syllabus.

c. The Project Work should be of such a nature that it could prove useful or be relevant from the System-oriented/Application/commercial.

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 final year of study decided by University.

f. Head/Co-ordinator of Computer Dept. must reject any project title which was previously carried out in any computer course. It must maintain Record that lists the projects along with other detail (like Guide, Session, and Number of students working on project etc.) that was carried out of and must be shown to external examiner at the time of examination.

Types of Project

As majority of the students are expected to work out a project in some industry/research and development laboratories/educational institutions/software export companies, it is suggested that the project is to be chosen by the candidate should have some direct relevance in day-to-day activities of the candidate in his/her institution.

The Applications Area of Project- Database Management System/Relational Database Management System/Internet/web Designing/Hardware and Software interaction based etc.

Project Proposal (Synopsis)

The project proposal should clearly state the objectives and environment to 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 (Database/Web Designing/Application/Hardware Interface etc.)
4. Tools/Platform, Languages to be used covered in the syllabus
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. Identification of Need. Preliminary Investigation. Feasibility Study. Need of New System. Flaws in Present System.
 - iii) Project Category.
 - iv) Software Requirement Specification.
 - v) Detailed System Analysis. Data Flow Diagram. Numbers of Modules and Process Logic. Data Structures and Tables. Entity-Relationship Diagram.
 - vi) System Design. Source Code. Screen Shots.
 - vii) Validation Checks.
 - viii) Implementation, Evaluation and Maintenance.
 - ix) Security Measures taken.
 - x) Future Scope of the project.
 - xi) Bibliography (APA Style)

Appendix

- O Survey Questionnaire

Note: Project report should be type/printed in double line space using A4 size bond papers with left margin of 1.5” and right margin of 1.0” in Times new Roman font.