

**Syllabus of**  
**B.Sc. (Information Technology)**  
**Part III (Semester- VI)**

**Designed by Dr. S.B. Kishor**



**GONDWANA UNIVERSITY,  
GADCHIROLI**

**SESSION 2014-2015**

## B. Sc. – III [Information Technology]

### SEMESTER VI

<b>Paper 1</b>	Bio-Informatics	<b>Theory : 80 Marks</b> <b>Internal : 20 Marks</b>	<b>Practical : 50 Marks</b>
<b>Paper 2</b>	Data Warehousing And Data Mining	<b>Theory : 80 Marks</b> <b>Internal : 20 Marks</b>	
<b>Paper 3</b>	Java	<b>Theory : 80 Marks</b> <b>Internal : 20 Marks</b>	<b>Practical : 50 Marks</b>
<b>Paper 4</b>	Project	<b>Internal: 50 Marks</b> <b>External : 50 Marks</b>	<b>Total Project Marks: 100</b>

**B.Sc. (IT) -III (Semester – VI)**

**Paper-1 :Bio-Informatics**

**Paper-2 :Data Warehousing And Data Mining**

**Paper-3 :Java**

**Paper-4 :Project**

**Practical Ibased on Paper 1 and 2**

**Practical Ibased on Paper 3**

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SEMESTER-VI**

**Paper-I : BIO-INFORMATICS**

**[ Marks: 80**

**(6BIT1)**

**UNIT - I: Introduction**

Historical Overview and Definition, Biological Classification and Nomenclature, Bioinformatics Applications, Major Databases In Bioinformatics, Data Management and Analysis, Molecular Biology and Bioinformatics, Central Dogma of Molecular Biology.

**Information Search and Data Retrieval:** Tools For Web Search, Data Retrieval Tools, Data Mining of Biological Databases.

**UNIT –II: Genome Analysis and Gene Mapping, Alignment of Pairs of Sequences**

Genome Analysis, Genome Mapping, The Sequence Assembly Problem, Genetic Mapping and Linkage Analysis, Physical Maps, Cloning The Entire Genome, Genome Sequencing, Application of Genetic Maps, Sequence Assembly Tools, Identification of Genes In Contigs, The Human Genome Project, Methods of Sequence Alignment, Using Scoring Matrices, Measuring Sequence Detection Efficiency.

**UNIT –III: Alignment of Multiple Sequences and Phylogenetic Analysis and Tools for Similarity Search and Sequence Alignment**

Methods of Multiple Sequence Alignment, Evaluating Multiple Alignments, Applications of Multiple Alignments, Phylogenetic Analysis, Methods of Phylogenetic Analysis, Tree Evaluation, Automated Tools For Phylogenetic Analysis. FASTA, BLAST, Filtering and Gapped BLAST, FASTA and BLAST Algorithms Comparison.

**UNIT –IV: Gene Identification and Prediction, Gene Expression and Microarrays, Protein Classification and Structure Visualization Protein Structure Prediction**

Basics of Gene Prediction, Pattern Recognition, Gene Prediction Methods, Gene Prediction Tools, DNA Microarrays, Clustering Gene Expression Profiles, Data Sources and Tools For Microarray Analysis, Application of Microarray Technology, Overview of Protein Structure, Protein Structure Visualization, Structure Based Protein Classification, Protein Structure Visualization Databases and Tools, Protein Identification and Characterization, Primary Structure Analysis and Prediction, Secondary Structure Analysis and Prediction

**Books:**

- 1) S.C.Rastogi, N.Mendiratta, P.Rastogi, “Bioinformatics, Methods and Applications”, TMH, ISBN: 81-203-3062-5.

- 2) M. Lesk, "Introduction to Bioinformatics", Oxford University Press, ISBN:10-0-19-568525-3.
- 3) Bergeron Bryan, "Bioinformatics Computing", PHI, ISBN: 81-203-2258-4.

**References:**

- 1) Dan E. Krane and Michael L.Raymer, "Fundamental Concepts of Bioinformatics", Pearson Education, ISBN: 81-7758-757-9.
- 2) Jean-Michael Claverie and Cedric Notredame, "Bioinformatics, A Beginner's Guide", WILEY-Dream-Tech, ISBN: 81-265-0380-7.

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**Paper-II: Data Warehousing And Data Mining [Marks : 80  
(6BIT2)**

**UNIT-I: Data Warehouse and Data Mart**

Characteristic of Data Warehouse, Data Mart, Type of Data Mart, Loading A Data Mart, Metadata For A Data Mart, Data Model For A Data Mart, Maintenance of A Data Mart, Nature of Data In A Data Mart, Software Components For A Data Mart, Table In Data Mart, External Data, Reference Data, Performance Issues, Monitoring Requirement For A Data Mart, Security In Data Mart.

**UNIT -II : OLTP and OLAP System**

OLTP and OLAP System, Data Modeling, Star Schema For Multidimensional View, Multifact Star Schema, Categories of OLAP, Tools, Manager Query Environment (MQE), CognosPowerply, IBM Focus Fusion, Pilot Software, Arbor Web, Information Advantage Web OLAP, Micro strategy DSS Web, Brio Technology, OLAP Tools and The Internet.

**UNIT -III Introduction to Data Mining**

Data Mining; Introduction, From Data Warehousing to Data Mining, Steps of Data Mining, Data Mining algorithm, Database segmentation, Predictive modeling, link Analysis, tools for Data Mining., Developing a Data Warehouse, Building a Data Warehouse, Data Warehouse Architectural strategies, Design considerations, Data Content, Metadata, Distribution of data,

**UNIT- IV: Tools, Application, Case Study of Data Mining.**

Tools For Data Warehousing, Performance Considerations, Crucial Decisions In Designing A Data Warehouse, Various Technology Considerations, Application of Data Warehousing and Data Mining, National Data Warehouses, Census Data, Areas For Data Warehousing and Data Mining With Case Studies.

Case Study – 1: Data Warehousing In State Government.

2: Data Warehousing For Ministry of Commerce

3: Data Warehousing In World Bank.

**Books:**

- 1) C.S.R. Prabhu, “Data Warehousing”, PHI Publication. ISBN : 978-83-203-3627
- 2) Mattission, “Web Warehousing and Knowledge Management”, TMH, ISBN-13-978-00704-11036.

**References:**

- 1) AmiteshSinha , “Data Warehousing”, Thomson pub.,ISBN-0790612496
- 2) Claude Seidman , “ Data Mining”, PHI Pub, ISBN -13-078-1-55860-901-3



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**Paper-III: JAVA**

**[Marks : 80**

**(6BIT3)**

**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



## **B.Sc. (I.T.) - III**

### **SEMESTER - VI**

### **PROJECT**

### **(6BIT4)**

#### **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 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 Areaof 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) ValidationChecks.
  - 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 e line space using A4 size bond papers with left margin of 1.5” and right margin