

Course Code: 105
Course Title: Data Processing and Analysis (DPA)

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Course Title	Data Processing and Analysis (DPA)								
Credits	4								
Course Category	Major Course								
Level of Course	200-299 (Intermediate Level)								
Teaching per Week	4 Hrs. (2 Hours Theory + 4 Hours Practical)								
Minimum weeks per Semester	15 (Including class work, examination, preparation etc.)								
Review / Revision	2022-2023								
Implementation Year:	A.Y. 2023-2024								
Purpose of Course	Understand concepts of Data and storage of data. This course is aimed to impart knowledge about storing data, concepts of database, retrieval of data and manipulation of data. It is aimed to cover effective storage of data, statistical analysis of data and graphical presentation of data. It also covers concepts of database and fundamental of query languages to insert, access, and manipulate data. This course is not spreadsheet or database specific. The course is not software specific. Any open source software can be used for practical.								
Course Objective	To learn and obtain the skills related to i) Concepts of data, data storage and statistical manipulation of data. ii) Introduction of spreadsheet and data manipulation using spreadsheet. iii) Concepts of database, storage and manipulation of data using query language.								
Pre-requisite	-								
Course Outcomes	CO1- Students will learn the concept of data and storage of data using worksheet. CO2- Learn the Concept of Spreadsheet, Using the spreadsheet students will able to learn data manipulation, Statistical analysis of data and graphical presentation of data. CO3-Learn the concept of database and data storage in database CO4-To understand the concept of data storage through the concept of fundamental of query language by learning DDL and DML Statements. CO5- To Learn the concept of Queries to manipulate data and handling of database using SQL.								
Mapping between Course Outcomes(CO) with Program Specific Outcomes(PSO)		PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
	CO1								
	CO2								
	CO3								
	CO4								
	CO5								
Course Content	UNIT-1: Concepts of worksheet: (Max.Weightage: 15%) 1.1 Fundamentals of Worksheet: 1.1.1 Concepts of workbook, adding worksheet, cell address, formula bar, column, rows, cells, Insert, delete, format cells , cell size (row-height, column weight), rename sheet, protect sheet, lock cell. 1.1.2 Cut, copy, paste, paste special, format painter, font size, font face, fill color, font color, font alignment 1.2 Alignment, indent, Number format, percent style, coma style, increase/decrease decimal 1.2.1 Insert picture, shapes 1.2.2 Insert Textbox, Header & Footer, Symbols								

1.2.3 Save, save as, save file as csv, spell check, protect sheet and Workbook, Linking spread sheets.

1.2.4 Print, Quick print, Print preview

1.2.5 Split, Hide and freeze panes in worksheet.

UNIT-2: Formulas, Chart and Data: (Max.Weightage: 15%)

2.1 Charts :

2.1.1 Creating 2D and 3D charts (Columns, Line, Pie, Bar, Scatter)

2.1.2 Difference among columns, Line and bar charts.

2.2 Formulas:

2.2.1 sum, average, count, max, min, sumif, pmt, stddev

2.2.2 Logical (if, AND, OR, NOT, TRUE, FALSE)

2.2.3 Date and Day function : Date, day, time, now, Hour, Minute, Second, Month, Days360, weekday

2.3 Data :

2.3.1 Sort Data, Filter Data

2.3.2 Text to columns, Remove Duplication

2.3.3 Consolidated Data (sum, count, max, min, average)

UNIT-3: Concepts of Database: (Max.Weightage: 25%)

3.1 Database characteristics:

3.1.1 Data Independence (Logical and Physical)

3.1.2 Components of Database (User, Application , DBMS, Database)

3.1.3 Database Architecture (1-tier, 2-tier, 3-tier)

3.1.3.1 Comparison, advantages and disadvantages.

3.2 Database Models (Hierarchical, Network, E/R, Relational)

3.2.1 E/R model : Entity, Relationship, Attribute

3.2.2 E/R Diagram : One to one, one to many , many to one, many to many

3.2.3 Strong entity, weak entity

3.2.4 key attribute, derived attribute, Multi-valued attribute

3.3 Types of keys :

3.3.1 Super key, candidate key, Primary key, Composite key, Foreign key, Unique key.

UNIT-4: Normalization and Concepts of SQL: (Max.Weightage: 25%)

4.1 Why normalization (Insertion, Updating, Deletion anomalies)

4.2 Normalization Rules:

4.2.1 Concepts of Dependency, Transitive Dependency

4.2.2 Armstrong Axioms

4.2.3 1st Normal Form, 2nd Normal Form, 3rd Normal Form, B.C.N.F.

4.3 Concepts of Structure Query Language (SQL)

4.3.1 SQL datatypes : int, float, double, char, varchar, number, varchar2, Text, date

4.4 DDL Statements :

4.4.1 Create , Drop, Truncate, Rename, Alter

4.5 DML and DQL(Data Query Language) Statements :

4.5.1 Insert, Update, Delete

4.5.2 select

UNIT-5: Queries (Single Table only) (Max.Weightage: 20%)

5.1 Using where clause and operators with where clause:

5.1.1 In, between , like, not in, =, !=, >, =, <=, wildcard operators

5.1.2 Order by, Group by, Distinct

5.1.3 AND, OR operators, Exists and not Exists

5.1.4 Use of Alias

5.2 Constraints (Table level and Attribute Level)

5.2.1 NOT NULL, CHECK, DEFAULT

5.2.2 UNIQUE, Primary Key, Foreign Key

5.2.3 On Delete Cascade

	<p>5.3 SQL Functions :</p> <p>5.3.1 Aggregate Functions: avg(), max(), min(), sum(), count(), first(), last().</p> <p>5.3.2 Scalar Functions: ucase(), lcase(), round(), mid().</p> <p>5.4 Creating sequence</p> <p>5.5 Views :</p> <p>5.5.1 Creating simple view, updating view, dropping view.</p> <p>5.5.2 Difference between View and Table.</p>
Reference Books	<ol style="list-style-type: none"> 1. OpenOffice.org For Dummies - Gurdy Leete, Ellen Finkelstein, Mary Leete - Wiley Pub. 2. Beginning OpenOffice 3: From Novice to Professional - Andy Channelle - Apress Pub. 3. The OpenOffice.org 2 Guidebook - Solveig Haugland 4. Taming Apache OpenOffice: Getting Started - Jean Hollis Weber - Friends of OpenDocument Inc. 5. Open Office Basic: An Introduction - James Steinberg - Gold Turtle Pub. 6. Database System Concepts: – Henry F. Korth & Abraham Silberschatz – McGraw Hill Education 7. Introduction to Database Management System– Bipin C. Desai – Galgotia Publication 8. Principles of database systems – Jeffery Ullman – Galgotia Publication 9. An introduction to Database Systems – C. J. Date – Addison Wesley 10. Introduction to database Management – Navin Prakash -TMH 11. Learn Open Office 3.1 Base – AZIMUTH 12. OpenOffice 3.4 Volume III: Base-Christopher N. Cain, Riley W. Walker-Quantum Scientific Publishing 13. Discovering SQL-A Hands-on Guide for Beginner-Alex KriegelWrox Publication 14. A Conceptual Guide to OpenOffice.org 3-R. Gabriel Gurley (Free E-book)
Teaching Methodology	Class Work, Discussion, Lab work, Self-Study, Seminars and/or Assignments
Evaluation Method	<p>50% Internal assessment.</p> <p>50% External assessment.</p>