



**Hindi Vidya Prachar Samiti's  
Ramniranjan Jhunjhunwala College  
of Arts, Science & Commerce  
(Empowered Autonomous College)**

**Affiliated to**

**UNIVERSITY OF MUMBAI**

**Program Code: RJCUCSDF**

**Syllabus for the**

**B.Sc Cyber Security & Digital Forensics (under NEP)**

**Course Codes: RJMINCSDF121**

**New Program to be started from the academic year 2026-2027**

## **Preamble**

The National Education Policy 2020 aims at imparting skill-based learning and caters to the multiple entry and exit facility for the students thus empowering them to acquire knowledge at their pace. In the three-year UG program, the student has two exit options. Students also have the option for choosing the Honors program of four years study in a given discipline and later converting it to five year integrated PG degree program. As undergraduate student, he/she learns the core subject (Major), subject complementing the core subject (Minor), a course from other discipline (OEC or GEC) Vocational and Skill Enhancement course from the Major (VSEC). The remaining verticals under NEP 2020 are IKS (Indian Knowledge System), AEC ( Ability Enhancement Course), VEC ( Value Enhancement Course) and with progressive three years of UG, student also completes at different levels OJT ( On Job Training), FP ( Field Projects), CEP ( Community Engagement Program) , RP ( Research Project) which helps him/her in understanding their roots, application of the knowledge for the benefit of self and the society. Vertical CC (Co-curricular activities and activities related to yoga and human well-being) helps in preparing youth with good character and interpersonal relationships.

## SEMESTER II

### Minor – RDBMS

Course Code	Course Title	Course Type	Credits	Duration
RJMINCSDF121	RDBMS	Minor (Theory)	2	30 Hours

### Course Objectives

Sr. No.	Course Objective
1	Understand relational database concepts and ER modeling for secure data storage.
2	Learn SQL for data definition, manipulation, and querying in cyber contexts.
3	Explore normalization and constraints to ensure data integrity.
4	Apply joins, subqueries, and aggregate functions for forensic data analysis.
5	Develop awareness of database security features like user roles and backups.

### Unit-wise Detailed Syllabus

Unit	Detailed Contents	Hours
I	<ul style="list-style-type: none"><li>Database Fundamentals</li><li>RDBMS Introduction: Relational model (tables, relations), keys (super, candidate, primary, foreign); ER diagrams for cyber schemas (e.g., entities: User, Log, Threat).</li><li>DDL Operations: CREATE TABLE with constraints (PRIMARY KEY, FOREIGN KEY); ALTER (add/drop columns); DROP DATABASE/TABLE; data types (CHAR, DATE, TIMESTAMP for logs).</li></ul> Practical Tasks: (1) Design ER; CREATE script. (2) ALTER tables and add CONSTRAINTS (3) DROP and recreate table. Tool: MySQL Workbench.	15
II	<ul style="list-style-type: none"><li>Data Manipulation and Advanced Queries</li><li>DML: INSERT multiple rows; UPDATE with WHERE; DELETE with conditions; transaction control (COMMIT/ROLLBACK).</li><li>Advanced SQL: SELECT with GROUP BY/HAVING, subqueries (correlated/non); joins (self-join for log correlation); aggregates (AVG threats per user).</li><li>Normalization: Forms (1NF: atomic values; 2NF: no partial dependency; 3NF: no transitive); anomaly examples in denormalized tables.</li></ul> Practical Tasks: (1) INSERT 10 log entries; UPDATE status to "Resolved." (2) Query average incidents per user with JOIN. (3) Normalize a sample denormalized table. Tool: MySQL Workbench.	15

### Course Outcomes (CO)

CO No.	Course Outcome	Bloom's Level	PSO Mapped
CO1	Describe RDBMS concepts and ER modeling for secure data.	Remember (L1), Understand (L2)	PSO1, PSO5
CO2	Explain DDL/DML and constraints for data integrity.	Understand (L2)	PSO1, PSO3, PSO5
CO3	Apply SQL queries and joins for basic forensic tasks.	Understand (L2), Apply (L3)	PSO1, PSO3, PSO5
CO4	Analyze normalization and aggregates for efficient databases.	Apply (L3), Analyze (L4)	PSO1, PSO2, PSO3, PSO5
CO5	Identify security features like roles in RDBMS setups.	Understand (L2), Analyze (L4)	PSO1, PSO3, PSO5

### Textbooks & References

Sr. No.	Title	Author / Source
1	Database System Concepts (7th Ed., 2023)	Abraham Silberschatz et al. / McGraw-Hill
2	SQL: The Complete Reference (3rd Ed.)	James R. Groff et al. / Oracle Press
3	Fundamentals of Database Systems (7th Ed.)	Ramez Elmasri, Shamkant B. Navathe / Pearson
4	MySQL (5th Ed.)	Paul DuBois / O'Reilly
5	RDBMS Lab Manual (B.Sc. IT, Mumbai University)	Various / Internal Publication