NOTIFICATION

No. 02 /2025 Dated : 01 /01/2025

Subject : Modification in the new syllabus of the subject 6KD01 SQL & Visualization of Semester VI of B.E. (Computer Science & Engineering) (Data Science) (C.B.C.S.).

Ref'ce : SGBAU Gazette Part II Notification No. 96/2024 dated 15.08.2024.

It is notified for general information of all concerned that the authorities of the University have accepted regarding modification in the new syllabus of the subject **6KD01 SQL & Visualization of Semester VI** of B.E. (Computer Science & Engineering) (Data Science) (C.B.C.S.) to be implemented from the academic session 2024-2025 onwards as mentioned below:

Sd/-
(Dr.Avinash Asanare)
Registrar
Sant Gadge Baba Amravati University

SEMESTER VI

6KD01 SQL & VISUALIZATION

Course Pre-requisite: Discrete Mathematics, Data Structures and Algorithm

Course Objectives: Throughout the course, students will be expected to demonstrate their understanding of Database Management Systems by being able to do each of the following:

- To understand the fundamental concepts of database management system.
- To learn database query languages.
- To give systematic database design approaches covering conceptual design, logical design and an overview of physical design.
- To understand the query processing and optimization.
- To learn basics of transaction management and concurrency control.

Course Outcomes (Expected Outcome): On completion of the course, the students will be able to:

1. Model, design and normalize databases for real life applications.
2. Discuss data models, conceptualize and depict a database system using ER diagram.
3. Query Database applications using Query Languages like SQL.
4. Design & develop transaction processing approach for relational databases.
5. Understand validation framework like integrity constraints, triggers and assertions.

SYLLABUS:

Unit I: Storage and File Structure: **(6 Hrs.)**
Overview of Physical Storage Media Magnetic Disk and Flash Storage, RAID, Tertiary Storage, File Organization, Organization of Records in Files, Data-Dictionary Storage, Database Buffer.

Unit II: Indexing and Hashing: **(6 Hrs.)**
Basic Concepts, Ordered Indices, B+-Tree Index Files, B+-Tree Extensions, Multiple-Key Access Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indice Index Definition in SQL.

Unit III: Database-System Architectures: **(6 Hrs.)**
Centralized and Client–Server Architectures, Server System Architectures, Parallel Systems, Distributed Systems, Network Types.

Unit IV: Object-Based Databases: **(6 Hrs.)**
Overview, Complex Data Types, Structured Types and Inheritance in SQL, Table Inheritance, Array and Multiset Types in SQL, Object-Identity and Reference Types in SQL, Implementing O-R Features, Persistent Programming Languages, Object-Relational Mapping, Object-Oriented versus Object-Relational.

Unit V: XML Motivation, Structure of XML

Data, XML Document Schema, Querying and Transformation, Application Program Interfaces to XM, Storage of XML Data, XML Applications. **(6 Hrs.)**

Unit VI: Data Visualization **(6 Hrs.)**

Definition and importance of data visualization, Types of Visualizations, Storytelling with Data Using visualizations to craft compelling narratives, Tools and Technologies Popular visualization software (e.g., Tableau, Power BI), Case Studies and Applications Real-world examples of effective visualization in various fields (business, healthcare, journalism etc).

TEXT BOOK: Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts, 6th Edition, Mc-Graw Hill.

REFERENCE BOOKS:

1. Raghu Ramakrishnan and Johannes Gehrke, Database Management Systems, McGraw-Hill.
2. Shamkant B. Navathe, RamezElmasri, Database Systems, Pearson Higher Education.
3. Garcia-Molina, Ullman, Widom: Database System Implementation, Pearson education.
4. S. K. Singh: Database Systems, Concepts, Design and Applications, Pearson Education.
5. G.K. Gupta: Database Management Systems, McGraw Hill.
6. Toledo and Cushman: Database Management Systems, (Schaum's Outlines)
7. Data Visualization with Microsoft Power Bi: How to Design Savvy Dashboardsby Alex Kolokolov (Author), Maxim Zelensky (Author) o'reilly publication.
8. Fundamentals of Data Visualization by Claus O. Wilke, by Claus O Wilke (Author) o'reilly publication.

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