SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Bachelor of Technology

Year: B. Tech III (Semester VI)

Subject Name: NoSQL Databases **Subject Code:** BTIT14604
Type of course: Professional Elective Course

Rationale: After studying this course, students will be able to Integrate MongoDB with Java, Node.js, Python and PHP application.

Teaching and Examination Scheme:

Teaching Scheme				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	0	2	4	60	25	15	30	20	150

CA1: Continuous Assessment (assignments / projects / open book tests / closed book tests) CA2: Sincerity in attending classes / class tests / timely submissions of assignments / self-learning attitude / solving advanced problems TEE: Term End Examination TEP: Term End Practical Exam (Performance and viva on practical skills learned in course) CA3: Regular submission of Lab work / Quality of work submitted / Active participation in lab sessions / viva on practical skills learned in course.

Contents:

Sr. No.	Contents	Total Hours
1.	**Introduction to NoSQL database**: Difference between RDBMS and NoSQL databases, Key-Value database,Document-based database, Column-based database, Graph-based database, CAP theorem, The Value of Relational Databases, Getting at Persistent Data, Concurrency, Integration, NoSQL,Key Points.	10
2.	**MongoDB:** Introduction to MongoDB, Overview of NoSQL databases, History of MongoDB, document based storage, key features, advantages, MongoDB shell, Data modeling in MongoDB, MongoDB data types, Database create and drop, Collection create and drop MongoDB NoSQL Database Setup.	15
3.	**CRUD operations**: CRUD operations in MongoDB, Relationships in MongoDB, Indexing, Sorting, Aggregate functions, limit(),skip()	08
4.	**Backup and Restore**: Data backup and restore, Cassandra vs MongoDB, CouchDB vs. MongoDB, Redis vs MongoDB	06
5.	**Connectivity:** Java MongoDB, PHP MongoDB. Python MongoDB	06

Suggested Specification table with Marks (Theory): (For B. Tech only)

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
20	20	**15**	**5**	-	-

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (Revised Bloom's Taxonomy)

Reference Books:

Sr No.	**Title of book /article**	**Author(s)**	**Publisher and details like ISBN**
1	MongoDB in Action	Kyle Banker, Peter Bakkum, Shaun Verch ,Douglas Garrett, Tim Hawkins	Manning Publications Co ISBN: 978-9351199359
2	MongoDB : The Definitive Guide	Kristina Chodorow	O'Reilly ISBN: 978-9351102694

Note: Students should refer to the latest editions of books

Course Outcomes (CO):

Sr. No.	**CO statements**	**Marks % weightage**
CO-1	Develop competency in describing how NoSQL databases differ from relational databases from a theoretical perspective.	20%
CO-2	Understand the Mongo as a datastore.	30%
CO-3	Perform CRUD operations	20%
CO-4	Index Mongo Collections	15%
CO-5	Use data backup and restore techniques	15%

List of Open learning website:

- https://www.mongodb.com/basics
- https://www.tutorialspoint.com/mongodb/index.htm

List of Experiments:

1. MongoDB Create Database - How to Create Database & Collection in MongoDB.
2. Add MongoDB Array using insert() Function.
3. Mongodb Primary Key — Example to set _id field with ObjectId()

4. MongoDB Query Document — using find() method with Examples
5. MongoDB Query using Pretty() &Distinct() Functions.
6. MongoDB Conditional Operator like gt,gte,lt,lte.
7. MongoDB Sort() & Limit() — MongoDB order with Sort() & Limit() Query
8. MongoDB Count() & Remove() Functions.
9. MongoDB Update() Document.
10. MongoDB Backup Methods — MongoDB Security, Monitoring & Backup (Mongodump)
11. MongoDB Regular Expression — Use a Regular Expression $Regex in MongoDB.