SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Master of Computer Applications

MCA Semester III

Subject Name: NoSQL Databases **Subject Code:** MTCA13303

Type of course: Professional Core Course

Prerequisite (if any):
Basic Knowledge of Databases, Basic understanding of HTTP, Basic understanding of JavaScript Basic understanding of JSON

List of Courses where this course will be prerequisite:
- MongoDB, Python, PHP

Rationale: (should also include Description of the relevance of this course in the Program)
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	60	40	200

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

Content:

Sr. No.	Content	Teaching Hrs.	Module Weightage
1	**Basics of NoSQL Database :** Introduction to NoSQL database, Difference between RDBMS and NoSQL databases, Types of NoSQL: 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.	**07**	**17%**
2	Introduction to MongoDB, Introduction to Cassandra, Overview of NoSQL databases, MongoDB introduction: history, 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	**12**	**27%**
3	CRUD operations CRUD operations in MongoDB, Relationships in MongoDB, Sorting, Map-Reduce, Aggregate functions, limit(), skip(), Indexing	**18**	**40%**
4	Backup and Restore Data , Cassandra vs MongoDB, CouchDB vs. MongoDB, Redis vs MongoDB	**4**	**8%**
5	Connectivity Java MongoDB, Node.js MongoDB	**4**	**8%**

Suggested Specification table with Marks (Theory):

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

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

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

Sr no	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	MongoDB in Action Second Edition	Kyle Banker, Peter Bakkum, Shaun Verch ,Douglas Garrett, Tim Hawkins	Manning Publications Co ISBN: 978-9351199359	2016	2nd Edition
2	MongoDB The Definitive Guide	Kristina Chodorow	O'Reilly ISBN: 978-9351102694	2013	2nd Edition

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	Develop competency in describing how NoSQL databases differ from relational databases from a theoretical perspective	17%
CO-2	Understand the Mongo as a datastore	27%
CO-3	Perform CRUD operations, sorting, understand Map-Reduce, Aggregation, Indexing	40%
CO-4	Use data backup and restore techniques	8%
CO-5	MongoDB Connectivity with Java and Node.js	8%

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO-1	3	3	0	0	2	2	0	2	2	3	0	3			
CO-2	3	3	2	0	2	0	0	2	2	0	0	3			
	PO	**PO**	**PO**	**PO**	**PO**	**PO**	**PO**	**PO**	**PO**	**PO**	**PO**	**PO**	**PS**	**PS**	**PS**

	1	2	3	4	5	6	7	8	9	10	11	12	O1	O2	O3
CO-3	3	3	0	2	3	0	0	0	2	2	2	3			
CO-4	3	3	0	1	3	0	0	0	1	2	3	3			
CO-5	3	3	0	1	3	0	0	0	2	2	3	3			
Rationale*															

Rationale*: Explaining why it is matching this particular program outcome

List of Open learning website:

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

List of Open Source Software:

FOR LAB SESSIONS:

List of Experiments:

Sr. No	Particulars
1	MongoDB Create Database - How to Create Database & Collection in MongoDB
2	Add MongoDB Array using insert() — Learn With Example
3	Mongodb Primary Key — Example to set _id field with ObjectId()
4	MongoDB Query Document — using find() method with Examples
5	MongoDB Cursor Tutorial — Learn with EXAMPLE
6	MongoDB Sort() & Limit() — MongoDB order with Sort() & Limit() Query
7	MongoDB Count() & Remove() Functions — Learn With Example
8	MongoDB Update() Document — Learn With Example
9	MongoDB Backup Methods — MongoDB Security, Monitoring & Backup (Mongodump)
10	MongoDB Regular Expression — Use a Regular Expression $Regex in MongoDB
11	MongoDB Aggregation – Use an aggregate() method in MongoDB

Major Equipment Needed:

NA