



# Swarnandhra College of Engineering & Technology

Autonomous and recognized under 2(F) and 12(B) by UGC

Recognized by AICTE, permanently affiliated to JNTUK Kakinada

Accredited by NAAC with 'A' Grade (2<sup>nd</sup> Cycle)

Seetharamapuram, Narsapur – 530280 (Andhra Pradesh)

## DEPARTMENT OF INFORMATION TECHNOLOGY

### TEACHING PLAN

| Course Code | Course Title    | Semester | Branch | Contact Periods /Week | Academic Year | Date of commencement |
|-------------|-----------------|----------|--------|-----------------------|---------------|----------------------|
| 23AD6E03    | NoSQL Databases | VI       | CSE-DS | 6                     | 2025-26       | 10-12-2025           |

#### COURSE OUTCOMES

|   |                                                                                                       |
|---|-------------------------------------------------------------------------------------------------------|
| 1 | Explain and compare different types of NoSQL Databases. (K4)                                          |
| 2 | Compare and contrast RDBMS with different NoSQL databases. (K2)                                       |
| 3 | Demonstrate the detailed architecture and performance tune of Document-oriented NoSQL databases. (K3) |
| 4 | Explain the performance tune of Key-Value Pair NoSQL databases. (K4)                                  |
| 5 | Apply NoSQL development tool son different types of NoSQL Databases. (K4)                             |

| UNIT                    | Out Comes / Bloom's Level | Topics No. | Topics/ Activity                               | Text Book/ Ref | Contact Hour | Delivery Method                                                       |
|-------------------------|---------------------------|------------|------------------------------------------------|----------------|--------------|-----------------------------------------------------------------------|
| I                       | CO – 1                    |            | Unit-1:                                        |                |              |                                                                       |
|                         |                           | 1.1        | Overview and History of NoSQL Databases        | T1             | 1            | Chalk & Board<br><br>Power point presentations<br><br>Assignment Test |
|                         |                           | 1.2        | Definition of the Four Types of NoSQL Database | T1             | 2            |                                                                       |
|                         |                           | 1.3        | The Value of Relational Databases              | T1             | 1            |                                                                       |
|                         |                           | 1.4        | Getting at Persistent Data                     | T1             | 1            |                                                                       |
|                         |                           | 1.5        | Concurrency                                    | T1             | 1            |                                                                       |
|                         |                           | 1.6        | Integration                                    | T1             | 1            |                                                                       |
|                         |                           | 1.7        | Impedance Mismatch                             | T1             | 1            |                                                                       |
|                         |                           | 1.8        | Application and Integration Databases          | T1             | 1            |                                                                       |
|                         |                           | 1.9        | Attack of the Clusters                         | T1             | 1            |                                                                       |
|                         |                           | 1.10       | The Emergence of NoSQL and Key Points.         | T1             | 1            |                                                                       |
| Content beyond syllabus |                           | 1.11       | Introduction to Big Data, Hadoop               | R1             | 1            | Video Lecture                                                         |
| Total                   |                           |            |                                                |                | 12           |                                                                       |
| II                      | CO – 2                    |            | Unit-2:                                        |                |              |                                                                       |



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|                         |        |      |                                                                                   |       |    |                                                                       |
|-------------------------|--------|------|-----------------------------------------------------------------------------------|-------|----|-----------------------------------------------------------------------|
|                         |        | 2.1  | Comparison of relational databases to new NoSQL stores                            | T1,T2 | 1  | Chalk & Board<br><br>Power point presentations<br>Assignment Test     |
|                         |        | 2.2  | MongoDB, Cassandra, HBASE, Neo4j use and deployment.                              | T1,T2 | 1  |                                                                       |
|                         |        | 2.3  | Application and RDBMS approach                                                    | T1    | 1  |                                                                       |
|                         |        | 2.4  | Challenges NoSQL approach                                                         | T1,T2 | 2  |                                                                       |
|                         |        | 2.5  | Key-Value and Document Data Models and Column-Family Stores                       | T1,T2 | 1  |                                                                       |
|                         |        | 2.6  | Aggregate-Oriented Databases, Replication and sharding                            | T1    | 1  |                                                                       |
|                         |        | 2.7  | MapReduce on databases. Distribution Models, Single Server                        | T1,T2 | 1  |                                                                       |
|                         |        | 2.8  | Sharding, Master-Slave Replication, Peer-to-Peer Replication                      | T1,T2 | 1  |                                                                       |
|                         |        | 2.9  | Combining Sharding and Replication                                                | T1    | 1  |                                                                       |
| Content beyond syllabus |        | 2.10 | Column oriented NoSQL databases using Apache HBASE                                | R2    | 1  | NPTEL Video                                                           |
| Total                   |        |      |                                                                                   |       | 11 |                                                                       |
| III                     | CO – 3 |      | Unit-3:                                                                           |       |    | Chalk & Board<br><br>Power point presentations<br><br>Assignment Test |
|                         |        | 3.1  | NoSQL Key/Value databases using MongoDB                                           | T1,T2 | 1  |                                                                       |
|                         |        | 3.2  | Document Databases, Document oriented Database Features                           | T1,T2 | 1  |                                                                       |
|                         |        | 3.3  | Consistency, Transactions, Availability,                                          | T1,T2 | 2  |                                                                       |
|                         |        | 3.4  | Query Features, Scaling and Suitable Use Cases                                    | T1,T2 | 1  |                                                                       |
|                         |        | 3.5  | Event Logging, Content Management Systems                                         | T1    | 1  |                                                                       |
|                         |        | 3.6  | Blogging Platforms, Web Analytics or Real-Time Analytics, E-Commerce Applications | T1    | 1  |                                                                       |
|                         |        | 3.7  | Complex Transactions Spanning Different Operations                                | T1    | 1  |                                                                       |
|                         |        | 3.8  | Queries against Varying Aggregate Structure.                                      | T1    | 2  |                                                                       |
| Content beyond syllabus |        | 3.9  | Data Modeling and Simple Queries with Cassandra                                   | R1    | 2  | Experimenta Learning                                                  |
| Total                   |        |      |                                                                                   |       | 12 |                                                                       |
| IV                      | CO – 4 |      | Unit-4:                                                                           |       |    | Chalk & Board<br><br>Power point                                      |
|                         |        | 4.1  | Column-oriented NoSQL databases using Apache HBASE                                | T1,T2 | 1  |                                                                       |
|                         |        | 4.2  | Column-oriented NoSQL databases using Apache Cassandra                            | T1,T2 | 2  |                                                                       |
|                         |        | 4.3  | Architecture of HBASE                                                             | T1,T2 | 1  |                                                                       |



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|                             |        |      |                                                                                                   |        |    |                                                                           |
|-----------------------------|--------|------|---------------------------------------------------------------------------------------------------|--------|----|---------------------------------------------------------------------------|
|                             |        | 4.4  | Column-Family Data Store Features                                                                 | T1,T2  | 1  | presentations<br><br>Assignment<br>Test                                   |
|                             |        | 4.5  | Consistency, Transactions, Availability                                                           | T1,T2  | 2  |                                                                           |
|                             |        | 4.6  | Query Features, Scaling, Suitable Use Cases                                                       | T1,T2  | 1  |                                                                           |
|                             |        | 4.7  | Event Logging, Content Management Systems                                                         | T1,T2  | 2  |                                                                           |
|                             |        | 4.8  | Blogging Platforms, Counters, Expiring Usage.                                                     | T1,T2  | 2  |                                                                           |
| Content beyond syllabus     |        | 4.9  | Introduction to Neo4j Graph Databases                                                             | T2     | 1  | NPTEL Video                                                               |
| Total                       |        |      |                                                                                                   |        | 13 |                                                                           |
| V                           | CO – 5 |      | Unit-5:                                                                                           |        |    |                                                                           |
|                             |        | 5.1  | NoSQL Key/Value databases using Riak                                                              | T2,R2  | 1  | Chalk<br>&<br>Board<br>Power point<br>presentations<br>Assignment<br>Test |
|                             |        | 5.2  | Key-Value Databases, Key-Value Store and its features.                                            | T2,R2  | 1  |                                                                           |
|                             |        | 5.3  | Consistency, Transactions, Query Features                                                         | T2,R2  | 1  |                                                                           |
|                             |        | 5.4  | Structure of Data, Scaling, Suitable Use Cases, Storing Session Information.                      | T2,R2  | 2  |                                                                           |
|                             |        | 5.5  | User Profiles, Preferences, Shopping Cart Data, Relationships among Data                          | T1,T2  | 1  |                                                                           |
|                             |        | 5.6  | Multioperation Transactions, Query by Data, Operations by Sets. Graph NoSQL databases using Neo4j | T1,T2  | 1  |                                                                           |
|                             |        | 5.7  | NoSQL database development tools and programming languages                                        | T1,T2  | 1  |                                                                           |
|                             |        | 5.8  | Graph Databases, Graph Database. Features                                                         | T1,T2  | 1  |                                                                           |
|                             |        | 5.9  | Consistency, Transactions, Availability, Query Features                                           | T2,R1  | 1  |                                                                           |
|                             |        | 5.10 | Scaling, Suitable Use Cases.                                                                      |        | 1  |                                                                           |
| Content beyond syllabus     |        | 5.11 | Redis Basics: Introduction and Key-Value Operations                                               | T2, R1 | 1  | Experimental Learning                                                     |
| Total                       |        |      |                                                                                                   |        | 12 |                                                                           |
| Cumulative Proposed Periods |        |      |                                                                                                   |        | 60 |                                                                           |

## Text Books:

| S.No. | AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION                                                                              |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Sadalage, P.&Fowler, NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence, 1st Edition, Wiley Publications, 2019. |
| 2     | Dan Sullivan, NoSQL for Mere Mortals, Addison Wesley, 16 April 2015.                                                                      |

## Reference Books:



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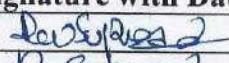
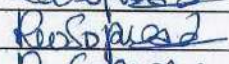
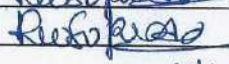
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| S.No.               | AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION                                                                                                            |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                   | Kristina Chodorow, MongoDB: The Definitive Guide (Paperback), Paperback, 2010.                                                                                          |
| 2                   | Tiago Macedo, Redis Cookbook: Practical Techniques for Fast Data Manipulation, Paperback, 2010.                                                                         |
| <b>Web Details:</b> |                                                                                                                                                                         |
| 1                   | <a href="https://www.ibm.com/cloud/learn/nosql-databases">https://www.ibm.com/cloud/learn/nosql-databases</a>                                                           |
| 2                   | <a href="https://www.coursera.org/lecture/nosql-databases/introduction-to-nosql-VdRNp">https://www.coursera.org/lecture/nosql-databases/introduction-to-nosql-VdRNp</a> |
| 3                   | <a href="https://www.geeksforgeeks.org/introduction-to-nosql/">https://www.geeksforgeeks.org/introduction-to-nosql/</a>                                                 |
| 4                   | <a href="https://www.javatpoint.com/nosql-databa">https://www.javatpoint.com/nosql-databa</a>                                                                           |

|     |                       | Name             | Signature with Date                                                                  |
|-----|-----------------------|------------------|--------------------------------------------------------------------------------------|
| i   | Faculty               | Dr. RVVSV Prasad |   |
| ii  | Module Coordinator    | Dr. RVVSV Prasad |   |
| iii | Programme Coordinator | Dr. RVVSV Prasad |  |

10/12/25

  
Principal