# TCET

# DEPARTMENT OF INFORMATION TECHNOLOGY (IT)

Credit Based Grading Scheme(Revised - 2012) - University of Mumbai

**CBGS-2012(R)**

Estd. 2001

| TCET/FRM/IP-02/09 | Revision: A |
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**Semester Plan**

**(Theory)**

**Semester: V** **Course: IT**

| **Subject: Advanced Database Management System** | **4 Lectures / Week** | **Class: TE IT A** |
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| Sr. No. | Prerequisite/ Bridge course: | Duration (Week /Hrs) | Modes of Learning | Recommended Sources |
|---|---|---|---|---|
| 1 | **Database Management Systemt** | **6** | **Self Learning/ Revision** | **Text Book:**<br>1.Database System Concepts - 6th edition - Avi Silberschatz<br>2.Database Management Systems, 3rd Edition (Irwin Computer Science) 3rd Edition<br>by Raghu Ramakrishnan<br>**Course Link:**<br>1.http://nptel.ac.in/courses/106106093/<br>2.http://nptel.ac.in/courses/106104135/ |

| Sr. No. | Module No. | Lesson No. | Topics Planned (Technology to be used) | Teaching Aids Required | Planned /Completion Date | Resource Book Reference | Remarks |
|---|---|---|---|---|---|---|---|
| 1 | 1 | L 1.1 | SOP – ADBMS Theory | Power point presentation, Chalk & Board | 07-10-2017 | Module 1 - 6 | |
| 2 | | L 1.2 | SOP – ADBMS Practical | Power point presentation, Chalk & Board | 07-12-2017 | Module 1 - 6 | |
| 3 | | L 2.1 | SOP – ADBMS OBE | Power point presentation, Chalk & Board | 17/7/17 | Module 1 - 6 | |
| 4 | | L 2.2 | Specifying Constraints as Assertions; Event Condition Action (ECA) model (Triggers) in SQL, Creating and working with Views in SQL | Power point presentation, Chalk & Board | 19/7/17 | RB Section 2.9.1, RB Section 2.9.2, RB Section 2.9.3, RB Section2.9.4, RB Section 2.9.5,RB Section 2.9.6 ,Text Book 1.1 | |
| 5 | | L 2.3 | Database Programming: Embedded SQL, Dynamic SQL and SQLJ, **LINQ Implementation** | Power point presentation, Chalk & Board | 20/7/17 | RB Section 2.9.7.1, RB Section 2.9.7.2, RB Section 2.9.7.3 ,Text Book 1.1 | |
| 6 | | L 3.1 | Database Programming with Function Calls: JDBC; Stored Procedures in SQL | Power point presentation, Chalk & Board | 24/7/17 | RB Section 2.9.7.4, RB Section 2.9.8 ,Text Book 1.1 | |
| 7 | 3 | L 3.2 | Introduction to Database Security Issues, Discretionary Access Control Based on Granting and Revoking Privileges | Power point presentation, Chalk & Board | 27/7/17 | RB Section 4.9.1, 4.9.2,Text Book 1.2 | |
| 8 | | L 3.3 | Mandatory Access Control and Role-Based Access Control for Multilevel Security | Power point presentation, Chalk & Board | **29/7/17** | RB Section 4.9.3,Text Book 1.2 | |
| 9 | | L 4.1 | SQL Injection; Introduction to Statistical Database Security | Power point presentation, Chalk & Board | 31/7/2017 | RB Section 4.9.4,Text Book 1.2 | |
| 10 | | L 4.2 | Introduction to Flow Control | Power point presentation, Chalk & Board | 08-03-2017 | RB Section 4.9.5, 4.9.6,Text Book 1.2 | |
| 11 | 4 | L 5.1 | Types of Distributed Database Systems | Power point presentation, Chalk & Board | 08-07-2017 | RB Section 6.9.1, RB Section 6.9.2, RB Section 6.9.3, RB Section 6.9.4, RB Section 6.9.5, RB Section6.9.6, ,Text Book 1.2 | |
| 12 | | L 5.2 | Distributed Database Architectures | Power point presentation, Chalk & Board | 08-10-2017 | RB Section 6.9.7, RB Section 6.9.8,Text Book 1.2 | |
| 13 | | L 5.3 | Data Fragmentation, Replication and Allocation Techniques for Distributed Database Design | Power point presentation, Chalk & Board | 08-12-2017 | RB Section 6.9.9,Text Book 1.2 | |
| 14 | | L 6.1 | Query Processing and Optimization in Distributed Databases | Power point presentation, Chalk & Board | 14/8/17 | RB Section 6.9.10,Text Book 1.2 | |

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| 15 | | L 6.2 | Overview of Transaction Management in Distributed Databases | Power point presentation, Chalk & Board | 19/8/2017 | RB Section 6.9.11,Text Book 1.2 | |
| 16 | | L 7.1 | Overview of Concurrency Control and Recovery in Distributed Databases | Power point presentation, Chalk & Board | 24/8/2017 | RB Section 6.9.11,Text Book 1.2 | |
| 17 | | L 8.1 | Data Warehouse Modeling Vs Operational Database Modeling; | Power point presentation, Chalk & Board | 31/8/2017 | RB Section 9.9.1, 9.9.2, Text Book 1.3, Ref. Book 2.1 | |
| 18 | | L 9.1 | Dimensional Model Vs ER Model; Features of a Good Dimensional Model | Power point presentation, Chalk & Board | 09-04-2017 | RB Section 9.9.3Text Book 1.3, Ref. Book 2.1 | |
| 19 | | L 9.2 | The Star Schema; How Does a Query Execute?, The Snowflake Schema | Power point presentation, Chalk & Board | 09-07-2017 | RB Section 9.9.4, RB Section 9.9.5, Text Book 1.3, Ref. Book 2.1 | |
| 20 | | L 10.1 | Fact Tables and Dimension Tables, Factless Fact Table; Updates To Dimension Tables: Slowly Changing Dimensions, Type 1, 2, 3 Changes | Power point presentation, Chalk & Board | 09-11-2017 | RB Section 9.9.6 to 9.9.9Text Book 1.3, Ref. Book 2.1 | |
| 21 | | L 10.2 | Large Dimension Tables, Rapidly Changing or Large Slowly Changing Dimensions, Junk Dimensions | Power point presentation, Chalk & Board | 14/9/17 | RB Section 9.9.10Text Book 1.3, Ref. Book 2.1 | |
| 22 | | L 10.3 | Keys in the Data Warehouse Schema, Aggregate Tables; Fact Constellation Schema or Families of Star | Power point presentation, Chalk & Board | 16/9/17 | RB Section 9.9.10 to 9.9.15Text Book 1.3, Ref. Book 2.1 | |
| 23 | | L 11.1 | Challenges in ETL Functions; Data Extraction | Power point presentation, Chalk & Board | 18/9/17 | RB Section 10.9.1, RB Section 10.9.2, RB Section 10.9.3Text Book 1.3, Ref. Book 2.1 | |
| 24 | | L 11.2 | Identification of Data Sources; Extracting Data: Immediate Data Extraction, Deferred Data Extraction | Power point presentation, Chalk & Board | 21/9/2017 | RB Section 10.9.4, RB Section 10.9.5Text Book 1.3, Ref. Book 2.1 | |
| 25 | 6 | L 12.1 | Data Transformation: Tasks Involved in Data Transformation, **Perform Data Loading, Cleansing and retrieval using Python and MySQL.** | Power point presentation, Chalk & Board | 25/9/2017 | RB Section 10.9.6,Text Book 1.3, Ref. Book 2.1Text Book 1.3, Ref. Book 2.1 | |
| 26 | | L 13.1 | Data Loading: Techniques of Data Loading, Loading the Fact Tables and Dimension Tables Data Quality; Issues in Data Cleansing | Power point presentation, Chalk & Board | 10-05-2017 | RB Section 10.9.7, RB Section 10.9.8Text Book 1.3, Ref. Book 2.1 | |
| 27 | | L 13.2 | Revision and Doubt Clearing | Power point presentation, Chalk & Board | 10-12-2017 | -- | |

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| Remark:<br>Course: | Syllabus Coverage: | Practice Session: 1<br>L 13.2 | Beyond Syllabus: 2<br>L2.3, 12.1 |

No. of (lectures planned)/(lecture taken): 26

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| **Advanced course: Database Application development using open source database.** | **20 Hours** | **Online NPTEL videos with Hands on Training in Laboratory** | **Web sources:**<br>**• http://blog.capterra.com/free-database-software/**<br>**• http://opensourceforu.com/2015/01/developing-applications-using-nosql-databases/**<br>**• https://www.mongodb.com/scale/open-source-software-development**<br>**• https://www.osalt.com/databases**<br>**• https://www.mysql.com/** |

**Text Books:**

1.1. Elmasri and Navathe, "Fundamentals of Database Systems", 6th Edition, PEARSON Education.
1.2. Korth, Slberchatz,Sudarshan, :"Database System Concepts", 6th Edition, McGraw – Hill
1.3. Theraja Reema, "Data Warehousing", Oxford University Press, 2009

**References:**

2.1. Paulraj Ponniah, "Data Warehousing: Fundamentals for IT Professionals", Wiley India.
2.2. C. J. Date, A. Kannan, S. Swamynathan "An Introduction To Database Systems", 8th Edition Pearson Education.
2.3. Raghu Ramakrishnan and Johannes Gehrke, "Database Management Systems" 3rd Edition - McGraw Hill
2.4. Ralph Kimball, Margy Ross, "The Data Warehouse Toolkit: The Definitive Guide To Dimensional Modeling", 3rd Edition. Wiley India.

**Digital Reference:**

3.1. http://datawarehouse4u.info/ETL-process.html
3.2. http://nptel.ac.in/courses/106106093/
3.3. http://datawarehouse4u.info/OLTP-vs-OLAP.html
3.4. http://nptel.ac.in/courses/106104135/

3.5. http://research.cs.wisc.edu/coral/mini_doc/logMgr/report/node2.html
3.6. http://www.dbta.com/Columns/DBA-Corner/The-DBAs-Guide-to-Application-Development-92526.aspx

**Mr. Shridhar Kamble** **Dr. Rajesh Bansode**
**Mr. Rahul Neve**

**Name & Signature of Faculty** **Signature of HOD** **Signature of Principal /Dean (Academics)**

**Date:** **Date:** **Date:**

**Note:**

1. Plan date and completion date should be in compliance

2. Courses are required to be taught with emphasis on resource book, course file, text books, reference books, digital references etc.

3. Planning is to be done for 15 weeks where 1st week will be AOP, 2nd -13th for effective teaching and 14th -15th week for effective university examination oriented teaching, mock practice session and semester consolidation.
4. According to university syllabus where lecture of 4 hrs/per week is mentioned minimum 55 hrs and in case of 3 lectures per week minimum 45 lectures are to be engaged are required to be engaged during the semester and therefore accordingly semester planning for delivery of theory lectures shall be planned.
5. In order to improve score in NBA, faculty members are also required to focus course teaching beyond university prescribed syllabus and measuring the outcomes w.r.t learning course and programme objectives.

6. Text books and reference books are available in syllabus. Here only additional references w.r.t. non –digital/ digital sources can be written (if applicable)

7. Technology to be used in class room during lecture shall be written below the topic planned within the bracket.