

|                                 |                                                          |
|---------------------------------|----------------------------------------------------------|
| <b>Subject Code: 1ET4040401</b> | <b>Subject Title: Advance Database Management System</b> |
| <b>Pre-Requisite</b>            | --                                                       |

#### **COURSE OBJECTIVE:**

This subject is associated with the designing of database for business, scientific and engineering application. By the end of this course the students will be able to write simple and advanced PL/SQL code blocks, use advanced features such as ref cursors and bulk fetches and database designing with normalization. Hence students will be able to design relational database which will help them in designing phase of projects in forthcoming semester.

#### **COMPETENCY:**

The course should be taught and implemented with the aim to develop different types of skills so that students are able to acquire following competency:

Design a relational database system with appropriate functionality to process the data and with constraints to maintain data integrity and avoid data redundancy.

#### **TEACHING AND EVALUATION SCHEME:**

| Teaching Scheme (Hours per week) |          |           |        | Evaluation Scheme (Marks) |                          |                          |                          | Total<br>(Marks) |
|----------------------------------|----------|-----------|--------|---------------------------|--------------------------|--------------------------|--------------------------|------------------|
| Lecture                          | Tutorial | Practical | Credit | Theory                    |                          | Practical                |                          |                  |
|                                  |          |           |        | University<br>Assessment  | Continuous<br>Assessment | University<br>Assessment | Continuous<br>assessment |                  |
| 3                                | 0        | 4         | 5      | 60                        | 40                       | 40                       | 60                       | 200              |

#### **DETAILS OF COURSE CONTENTS:**

| <b>SR. NO.</b>  | <b>Topic and Sub-Topics</b>                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Total Hrs.</b> | <b>WEIGHTAGE %</b> |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|
| <b>Unit –I</b>  | <b>Advanced SQL</b><br>1.1 Transactional Control: Commit, Save point, Rollback<br>1.2 DCL Commands : Grant and Revoke<br>1.3 Types of locks :<br>i. Row level locks<br>ii. Table level locks<br>iii. Shared lock<br>iv. Exclusive lock<br>v. Deadlock<br>1.4 Synonym : Create synonym<br>1.5 Sequences: Create and alter sequences<br>1.6 Index : Unique and composite<br>1.7 Views : Create/Replace, Update and alter views | 10                | 25                 |
| <b>Unit –II</b> | <b>PL / SQL and Triggers</b><br>2.1 Basics of PL / SQL<br>2.2 Datatypes<br>2.3 Advantages<br>2.4 Control Structures : Conditional, Iterative, Sequential<br>2.5 Exceptions: Predefined Exceptions ,User defined exceptions<br>2.6 Cursors: Static (Implicit & Explicit), Dynamic                                                                                                                                             | 10                | 25                 |

|                   |                                                                                                                                                                                                                                                       |    |    |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
|                   | 2.7 Procedures & Functions<br>2.8 Packages : Package specification, Package body, Advantages of package<br>2.9 Fundamentals of Database Triggers<br>2.10 Creating Triggers<br>2.11 Types of Triggers : Before, after for each row, for each statement |    |    |
| <b>Unit – III</b> | <b>Functional Dependency and Decomposition</b><br>3.1 Basics of Functional Dependency<br>3.2 Functional dependency diagram and examples<br>3.3 Full function dependency (FFD)<br>3.4 Lossy Decomposition<br>3.5 Lossless join decomposition           | 08 | 20 |
| <b>Unit – IV</b>  | <b>Normalization</b><br>4.1 Basics of Normalization<br>4.2 Normal Forms<br>i. First Normal Form (1NF)<br>ii. Second Normal Form (2NF)<br>iii. Third Normal Form (3NF)                                                                                 | 08 | 20 |
| <b>Unit - V</b>   | <b>Transaction Processing</b><br>5.1 Introduction to transaction concepts<br>5.2 Introduction to Concurrency control                                                                                                                                  | 06 | 10 |

#### **COURSE OUTCOME:**

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

- Execute various advance SQL queries related to Transaction Processing using concept of Concurrency control.
- Demonstrate use of Database Object.
- Perform PL/SQL programming using concept of Cursor Management, Error Handling, Package and Triggers.
- Understand Functional Dependency and Functional Decomposition.
- Apply various Normalization techniques.

#### **SUGGESTED LIST OF EXERCISES/PRACTICAL/EXPERIMENTS:**

| S. No. | Unit No. | Exercises<br>(Course Outcomes in Psychomotor Domain according to NBA Terminology) | Approx. Hrs. Required |
|--------|----------|-----------------------------------------------------------------------------------|-----------------------|
| 1      | I        | Perform queries for DCL Commands and Locks                                        | 4                     |
| 2      | I        | Implement authorization, authentication, privileges on database.                  | 4                     |
| 3      | I        | Perform queries to Create synonyms, sequence and index                            | 4                     |
| 4      | I        | Perform queries to Create, alter and update views                                 | 4                     |
| 5      | II       | Implement PL/SQL programmes using control structures                              | 4                     |
| 6      | II       | Implement PL/SQL programmes using Cursors                                         | 4                     |
| 7      | II       | Implement PL/SQL programmes using exception handling.                             | 4                     |
| 8      | II       | Implement user defined procedures and functions using PL/SQL blocks               | 4                     |
| 9      | II       | Perform various operations on packages.                                           | 4                     |
| 10     | II       | Implement various triggers                                                        | 6                     |
| 11     | III      | Practice on functional dependencies                                               | 4                     |
| 12     | IV       | Practice on Normalization – using any database perform various                    | 5                     |

|              |    |                                    |           |
|--------------|----|------------------------------------|-----------|
|              |    | normal forms.                      |           |
| 13           | VI | Practice on transaction processing | 5         |
| <b>Total</b> |    |                                    | <b>56</b> |

#### **LIST OF REFERENCES:**

##### **Text Books**

Sql/ Pl/SQL by Bayross, Ivan(BPB)

An Introduction to Database Systems by Date, C. J. (Pearson Education)

##### **Reference Books**

Database System Concepts by Korth, Henry (MGH)

Database Systems Concepts, design and Applications Singh, S. K. (Pearson Education)

##### **E- Learning References**

- i. Software: Oracle 10e/11g express edition
- ii. DBMS:<http://nptel.iitm.ac.in/video.php?subjectId=106106093>
- iii. SQL Plus Tutorial: <http://holowczak.com/oracle-sqlplus-tutorial/>
- iv. DatabaseTutorials:<http://www.roseindia.net/programming-tutorial/DatabaseTutorials>
- v. Notes : <http://service.felk.cvut.cz/courses/X36SQL//cviceni/plsql/pdf/>
- vi. SQL Basic Concepts: <http://www.w3schools.com/sql/>
- vii. SQL Tutorial : <http://beginner-sql-tutorial.com/sql.htm>