

**Course Objective:**

- To create a database and query it using SQL, design forms and generate reports.
- Understand the significance of integrity constraints, referential integrity constraints, triggers, assertions.

**Learning Outcome:**

- Design databases
- Retrieve information from data bases
- Use procedures to program the data access and manipulation
- Create user interfaces and generate reports

**List Of Experiments:**

1. Practice session: Students should be allowed to choose appropriate DBMS software, install it, configure it and start working on it. Create sample tables, execute some queries, use SQLPLUS features, use PL/SQL features like cursors on sample database. Students should be permitted to practice appropriate User interface creation tool and Report generation tool.
2. A college consists of number of employees working in different departments. In this context, create two tables **employee** and **department**. Employee consists of columns empno, empname, basic, hra, da, deductions, gross, net, date-of-birth. The calculation of hra,da are as per the rules of the college. Initially only empno, empname, basic have valid values. Other values are to be computed and updated later. Department contains deptno, deptname, and description columns. Deptno is the primary key in department table and referential integrity constraint exists between employee and department tables. Perform the following operations on the the database:
  - ✓ Create tables department and employee with required constraints.
  - ✓ Initially only the few columns (essential) are to be added. Add the remaining columns separately by using appropriate SQL command
  - ✓ Basic column should not be null
  - ✓ Add constraint that basic should not be less than 5000.
  - ✓ Calculate hra,da,gross and net by using PL/SQL program.
  - ✓ Whenever salary is updated and its value becomes less than 5000 a trigger has to be raised preventing the operation.
  - ✓ The assertions are: hra should not be less than 10% of basic and da should not be less than 50% of basic.
  - ✓ The percentage of hra and da are to be stored separately.



- ✓ When the da becomes more than 100%, a message has to be generated and with user permission da has to be merged with basic.
- ✓ Empno should be unique and has to be generated automatically.
- ✓ If the employee is going to retire in a particular month, automatically a message has to be generated.
- ✓ The default value for date-of-birth is 1 jan, 1970.
- ✓ When the employees called daily-wagers are to be added the constraint that salary should be greater than or equal to 5000 should be dropped.
- ✓ Display the information of the employees and departments with description of the fields.58
- ✓ Display the average salary of all the departments.
- ✓ Display the average salary department wise.
- ✓ Display the maximum salary of each department and also all departments put together.
- ✓ Commit the changes whenever required and rollback if necessary.
- ✓ Use substitution variables to insert values repeatedly.
- ✓ Assume some of the employees have given wrong information about date-of-birth. Update the corresponding tables to change the value.
- ✓ Find the employees whose salary is between 5000 and 10000 but not exactly 7500.
- ✓ Find the employees whose name contains \_en'.
- ✓ Try to delete a particular deptno. What happens if there are employees in it and if there are no employees.
- ✓ Create alias for columns and use them in queries.
- ✓ List the employees according to ascending order of salary.
- ✓ List the employees according to ascending order of salary in each department.
- ✓ Use \_&&' wherever necessary
- ✓ Amount 6000 has to be deducted as CM relief fund in a particular month which has to be accepted as input from the user. Whenever the salary becomes negative it has to be maintained as 1000 and the deduction amount for those employees is reduced appropriately.
- ✓ The retirement age is 60 years. Display the retirement day of all the employees.
- ✓ If salary of all the employees is increased by 10% every year, what is the salary of all the employees at retirement time.
- ✓ Find the employees who are born in leap year.
- ✓ Find the employees who are born on feb 29.
- ✓ Find the departments where the salary of atleast one employee is more than 20000.
- ✓ Find the ~~department~~ departments where the salary of all the employees is less than 20000.
- ✓ On first January of every year a bonus of 10% has to be given to all the employees. The amount has to be deducted equally in the next 5 months. Write procedures for it.
- ✓ As a designer identify the views that may have to be supported and create views.
- ✓ As a designer identify the PL/SQL procedures necessary and create them using cursors.

SAH  
Gred

- ✓ Use appropriate Visual programming tools like oracle forms and reports, visual basic etc to create user interface screens and generate reports.

**Note:** As a designer identify other operations that may be required and add to the above list. The above operations are not in order. Order them appropriately. Use SQL or PL/SQL depending on the requirement.

3. Students may be divided into batches and the following experiments may be given to them to better understand the DBMS concepts. Students should gather the required information, draw ER diagrams, map them to tables, normalize, create tables, triggers, procedures, execute queries, create user interfaces, and generate reports.

- ✓ Student information system
- ✓ APSRTC reservation system
- ✓ Hostel management
- ✓ Library management
- ✓ Indian Railways reservation
- ✓ Super market management
- ✓ Postal system
- ✓ Banking system
- ✓ Courier system
- ✓ Publishing house system

4. Design of user interfaces and generation of reports

**References:**

1. "Learning Oracle SQL and PL/SQL", Rajeeb C. Chatterjee, PHI.
2. "Oracle Database 11g PL/SQL Programming", M.Mc Laughlin, TMH.
3. "Introduction to SQL", Rick F.Vander Lans, Pearson education.
4. "Oracle PL/SQL", B.Rosenzweig and E.Silvestrova, Pearson education



*[Handwritten signature]* *[Handwritten signature]*