**Case Study: University Course Management System**

**Problem Statement:**

Design and implement a University Course Management System using Oracle SQL and PL/SQL. The system will be used to manage courses, students, and enrollments. Your task is to create the necessary database schema, populate the database with sample data, and develop PL/SQL procedures to handle course registration, student enrollment, and grade assignment.

**Requirements:**

1. **Course Management**:
   * Implement the functionality to add, update, delete, and search for courses.
   * Ensure that each course has attributes such as COURSE\_ID, COURSE\_NAME, DEPARTMENT, CREDITS, and INSTRUCTOR.
2. **Student Management**:
   * Implement the functionality to add, update, delete, and search for students.
   * Ensure that each student has attributes such as STUDENT\_ID, FIRST\_NAME, LAST\_NAME, DATE\_OF\_BIRTH, GENDER, EMAIL, and PHONE\_NUMBER.
3. **Enrollment Management**:
   * Implement the functionality to register students for courses, update enrollments, and assign grades.
   * Track enrollments with attributes such as ENROLLMENT\_ID, STUDENT\_ID, COURSE\_ID, ENROLLMENT\_DATE, and GRADE.

**Tasks:**

1. **Design the Database Schema**:
   * Create the Courses, Students, and Enrollments tables with the appropriate fields and constraints.
   * Define primary keys and foreign keys to maintain data integrity.
2. **Populate the Database with Sample Data**:
   * Insert sample records into the Courses, Students, and Enrollments tables to facilitate testing of the system.
3. **Develop PL/SQL Procedures**:
   * Create a procedure to handle course registration. The procedure should insert a new course record and ensure no duplication.
   * Create a procedure to handle student enrollment. The procedure should check course availability, insert a new enrollment record, and update the student's enrollment status.
   * Create a procedure to assign grades to students. The procedure should update the enrollment record with the assigned grade.

**Expected Outcomes:**

1. **Courses Table**:
   * Contains all information about the courses offered at the university.
2. **Students Table**:
   * Contains details of all students enrolled at the university.
3. **Enrollments Table**:
   * Tracks the enrollments of students in courses, including enrollment dates and grades.
4. **PL/SQL Procedures**:
   * Efficiently manage course registration, student enrollment, and grade assignment, maintaining accurate records in the database.

**Deliverables:**

1. SQL scripts to create the Courses, Students, and Enrollments tables.
2. SQL scripts to insert sample data into the tables.
3. PL/SQL scripts for the procedures to register courses, enroll students, and assign grades.
4. Documentation explaining how to set up and use the system, including how to run the PL/SQL procedures.

**Database Schema:**

1. **Courses Table**:
   * **COURSE\_ID**: Number, Primary Key
   * **COURSE\_NAME**: Varchar2(100)
   * **DEPARTMENT**: Varchar2(50)
   * **CREDITS**: Number
   * **INSTRUCTOR**: Varchar2(50)
2. **Students Table**:
   * **STUDENT\_ID**: Number, Primary Key
   * **FIRST\_NAME**: Varchar2(50)
   * **LAST\_NAME**: Varchar2(50)
   * **DATE\_OF\_BIRTH**: Date
   * **GENDER**: Varchar2(10)
   * **EMAIL**: Varchar2(100)
   * **PHONE\_NUMBER**: Varchar2(15)
3. **Enrollments Table**:
   * **ENROLLMENT\_ID**: Number, Primary Key
   * **STUDENT\_ID**: Number, Foreign Key References Students(STUDENT\_ID)
   * **COURSE\_ID**: Number, Foreign Key References Courses(COURSE\_ID)
   * **ENROLLMENT\_DATE**: Date
   * **GRADE**: Varchar2(2)

**Case Study Task:**

* **Design**: Create the database schema as provided.
* **Implement**: Insert sample data into the tables.
* **Develop**: Write PL/SQL procedures for course registration, student enrollment, and grade assignment.
* **Test**: Test the procedures with various scenarios (e.g., registering a course, enrolling a student, assigning grades, ensuring proper updates).