CSCI3100 Software Engineering
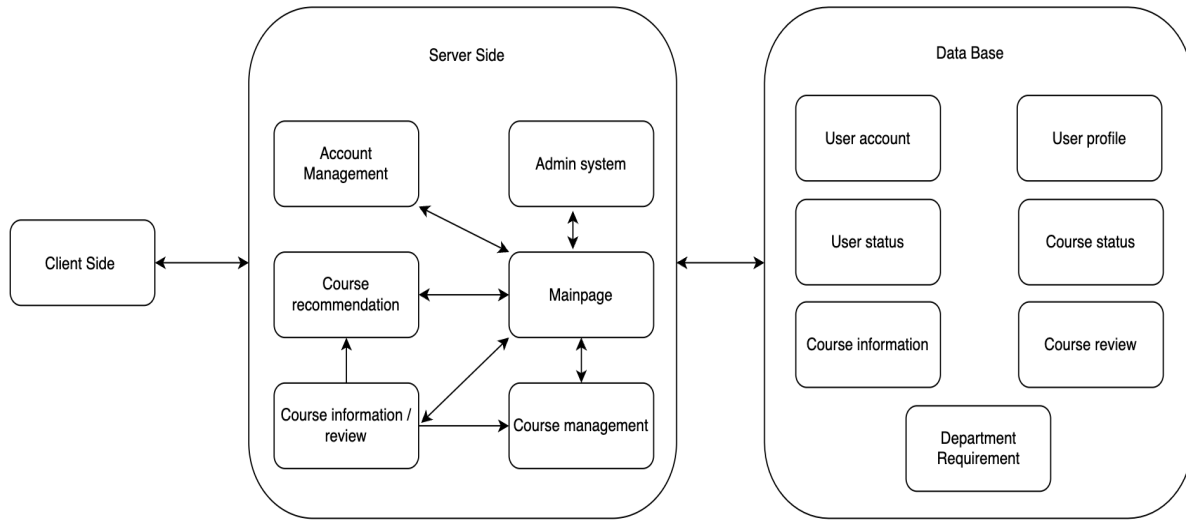# DFD Specification Document
Group B7

CU advanced Course Selection System

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1. High-Level Context Diagram

Figure 1. High-Level Context Diagram

 The figure 1 visualizes the High-Level context diagram of CU advanced Course Selection System's entire system. The application will be divided into client side and server side. As mentioned in the High-Level document design, client side would be implemented using React JS. Then, the server side would be implemented using NodeJS and ExpressJS, and MySQL for the Database.
There are six main features including in CU advanced Course Selection System:

1. User Authentication
2. Course Recommendation System
3. Course information and review system
4. Course management system
5. Main page
6. Admin page

Each main feature has variegated subfeatures, and the specific feature functions are explained in the latter pages.

2. Feature Diagram
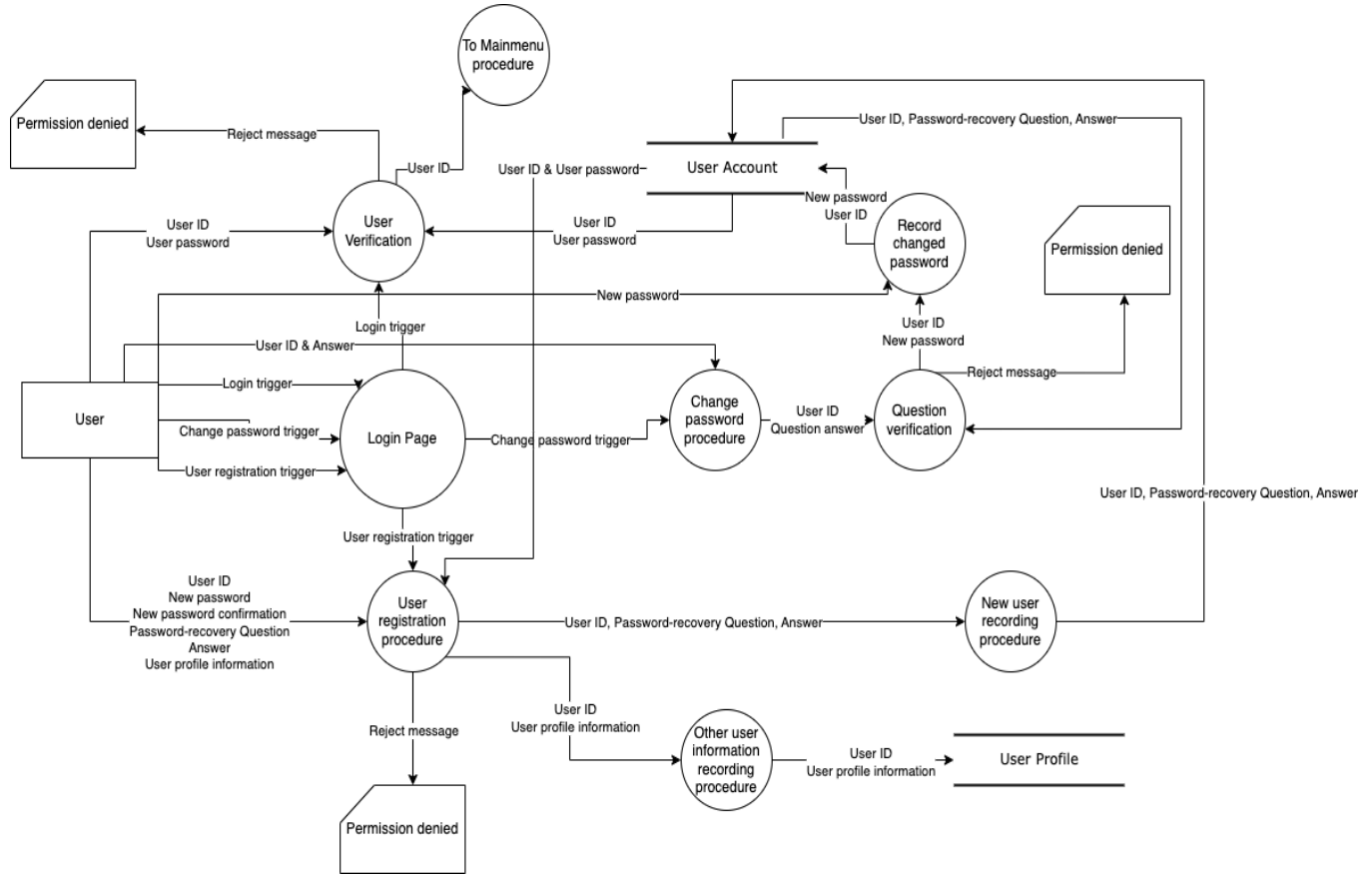### 2.1. DFD for User Authentication

Figure 2. User Authentication Data flow Diagram

In login page, user can choose one of three subfeatures:
   a. Login
   b. Change password
   c. User registration
1. Login feature
   In User Verification, User input user ID & password compare stored user ID & password from User Account database.
   If verification fails, return reject message
   If verification succeeds, go to main menu procedure with User ID information
2. Change password feature
   Password-recovery questions and answers during user registration will be used for verification users to change passwords.
   In Change password procedure, after checking stored password-recovery questions from User Admin database, user input User ID, Answer. Then, compare the information with the User Account database.
   If both information are matched, user input new password to Record changed password procedure, and save the changed password to User Account database

If information does not match, return reject message
3. User registration
   User input User ID, New password, New password confirmation, password-recovery question, answer, user profile information to User registration procedure.
   Check there is no failing condition
      a. New password and New password confirmation are not matched
      b. There is existing user ID from User Account database
      c. Non acceptable inputs

If one of the failing conditions met, it would return a reject message.
If there are no failing conditions, record user ID and user profile information to the User Profile database.
Record user ID,password-recovery question, answer, user ID and new password to User Account database.
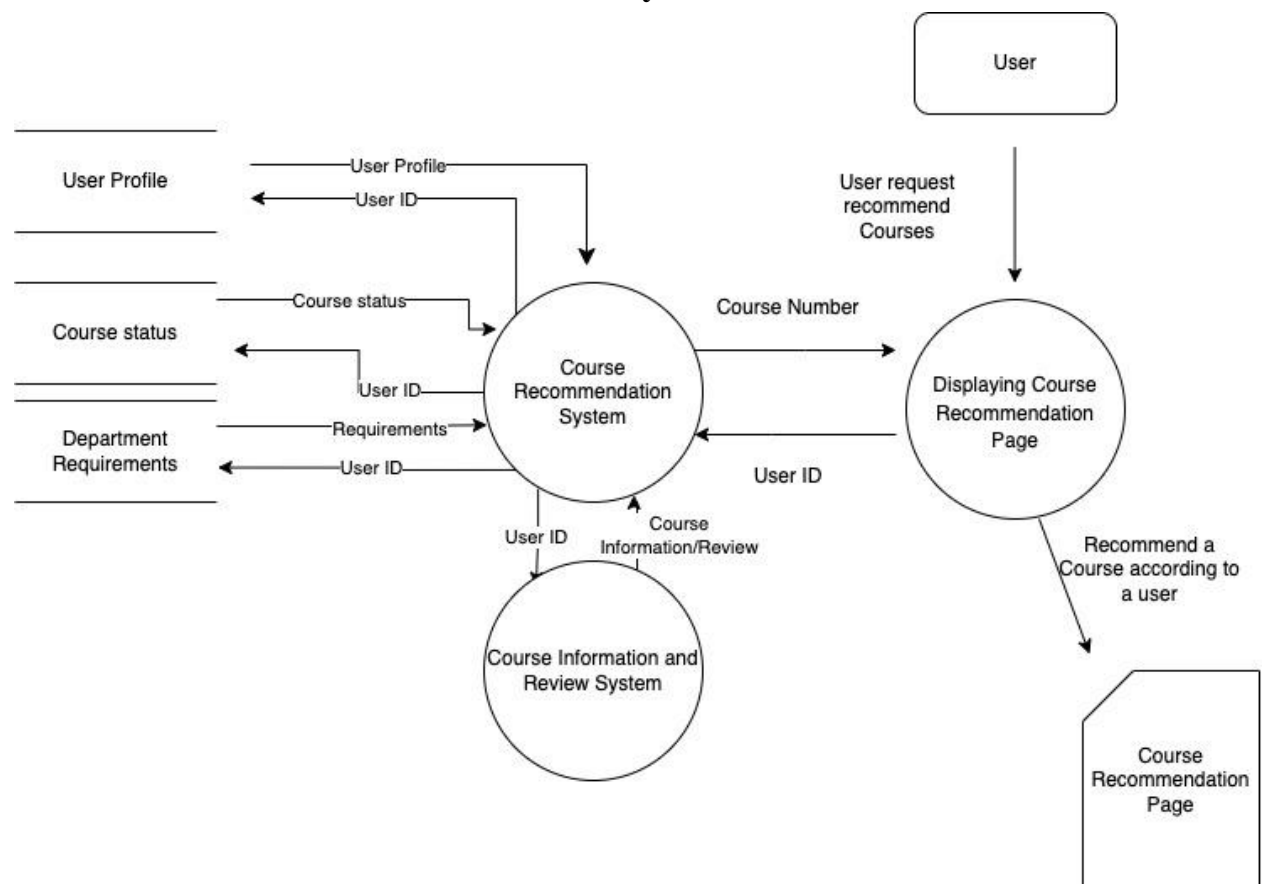
2.2 DFD for Course Recommendation System

Figure 3. Course Recommendation System Data Flow Diagram

If a user requests a Course recommendation to the displaying course recommendation page. Then, the Course recommendation System will gain a dataset according to a userID from the Displaying course recommendation page. Course recommendation System will read data based on User ID such as requirements, schedules, course status, course review and user profiles from User Profile database, Course

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status database, and Department requirement database. Recommendation system works out with a suitable course number based on the given information by certain algorithms such as best course rating, available schedule for certain students, and course requirements based on the student's department. Finally, the Displaying course recommendation page will obtain recommended course numbers from a Course Recommendation System; then output to the course recommendation page.
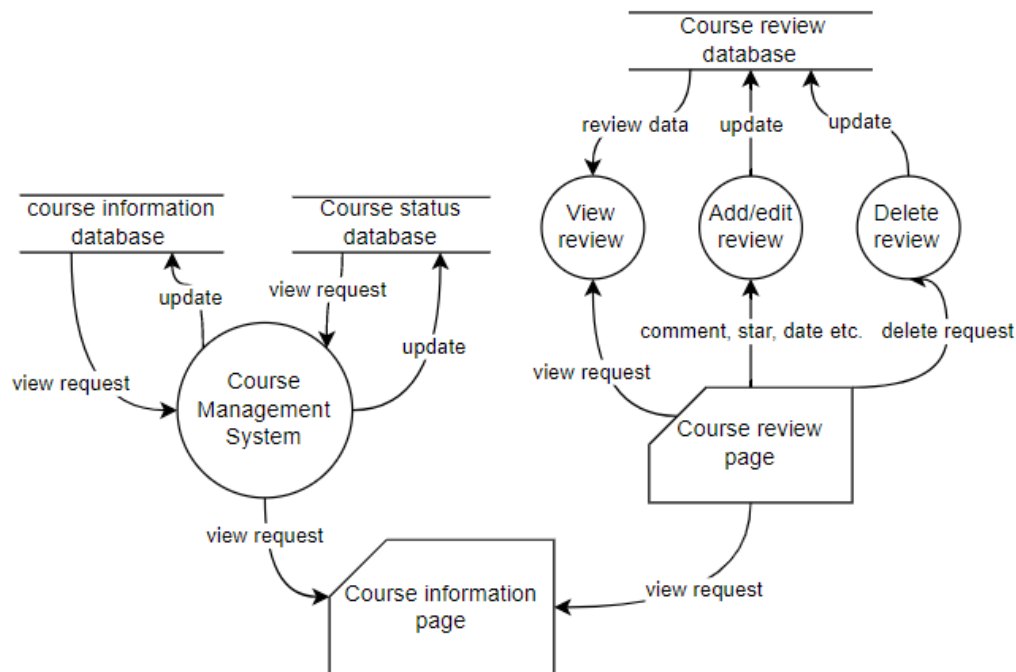
2.3. DFD for course information and review system

Figure 4. Course Information and Review Management System Data Flow Diagram

The course information and review system management depicts a holistic interface for course information display and course review display/ management. Course information page mainly covers the course management system (details described below in **4.**), and the course review page manages the display and functionalities of the course review system, such as add/update/delete of course review. Such data managed by the course review system will also be utilized for the course recommendation system. Note that admins have more permission to functionalities over normal users - such as editing course information, editing/deleting other people's review etc. Detailed description on admin/normal user permissions are described in the authentication part.

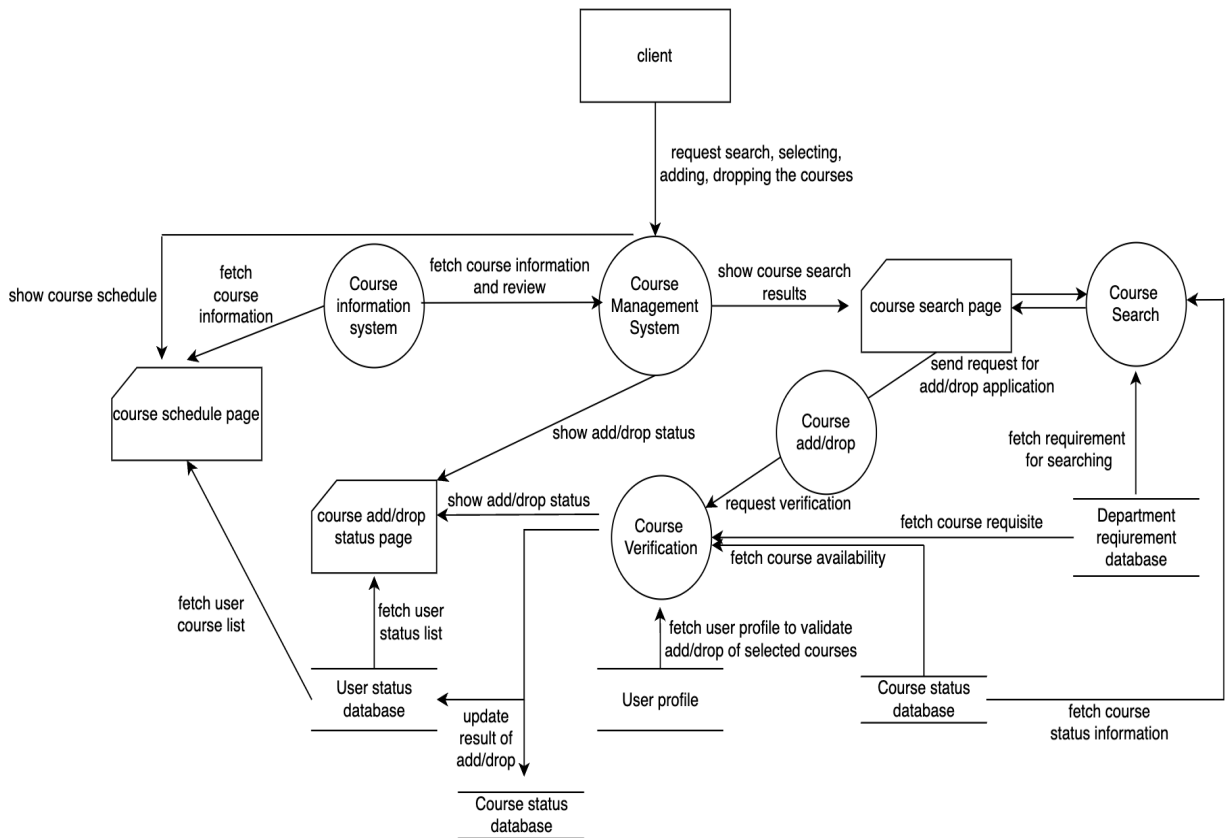## 2.4. DFD for course management system

Figure 5. Course Management System Data Flow Diagram

The course management system is the main interface for course search, selection, add and drop of the courses. The interface consists of search, add/drop, verification functions for course management. The system additionally interacts with the course information system to fetch the course information and review. It additionally interacts with the department requirement base for requirement data fetching, course status database for course fetch and update availability, user profile for course validation, user status for updating add/drop result and fetch user status for user schedule page. As a result, users could see the result of course search, course add/drop status, and course schedule with client request.
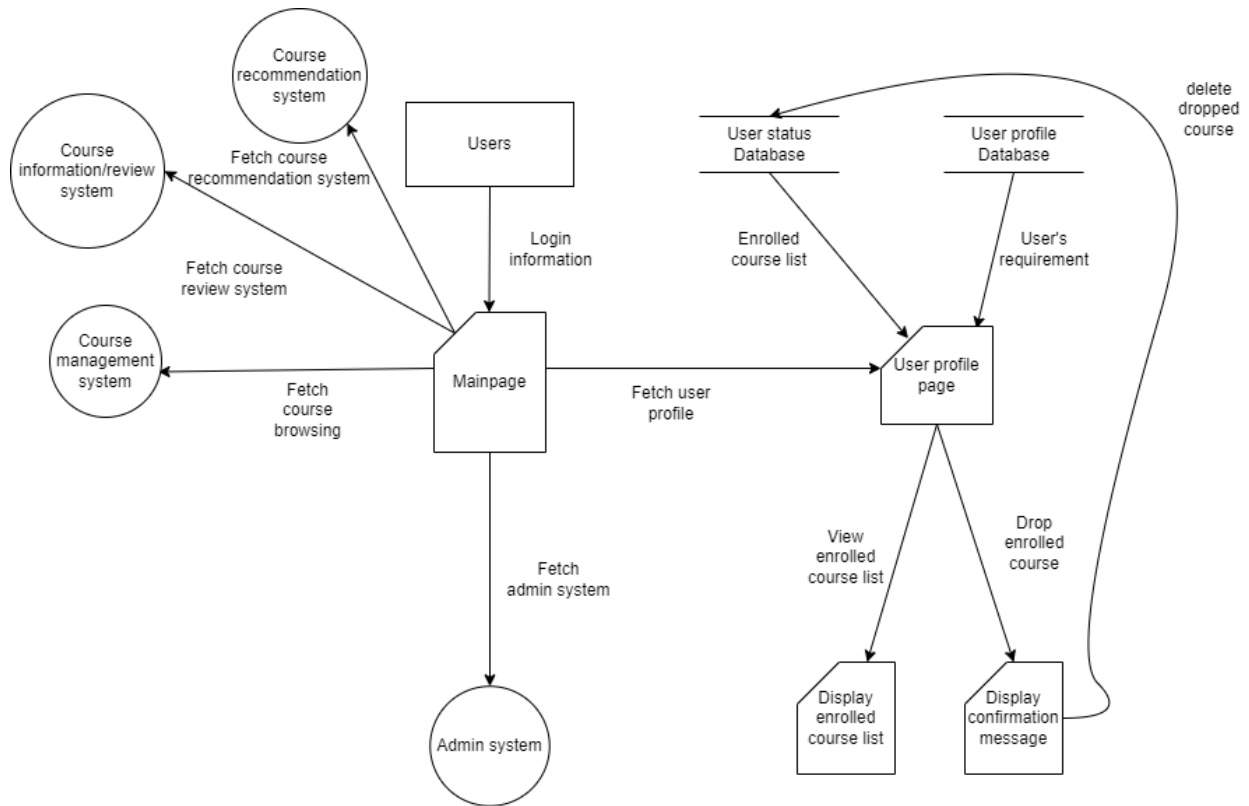
2.5. DFD for Mainpage

Figure 6. Main Page Data Flow Diagram

 In the main page, users can search all course information through the course management system. In the user profile page, users can view their enrolled course list and drop enrolled courses. User profile page will get the user's course requirement through the user profile database and enrolled course list through user status database. In addition, in the main page, users can fetch course information/review system and course recommendation system. For admin, they can fetch the admin system.
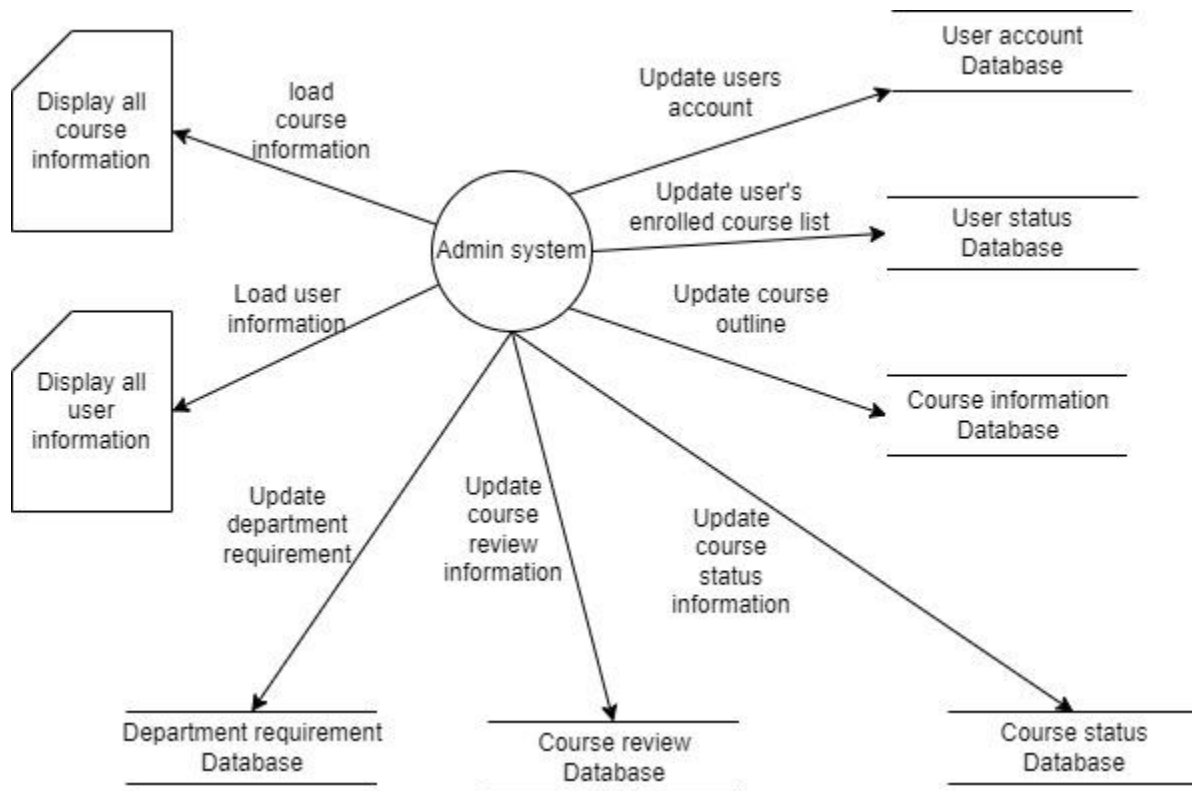
2.6. DFD for admin system

Figure 7. Admin System Data Flow Diagram

In the admin system, admin will view all course information and all user information. For the user's information part, the admin can update the user's account information(add or delete). In addition, the admin can add or delete a user's enrolled course from the user's course list. For the course's information part, the admin can update course outline, status, and review through the course database. In the department requirement database, the admin can update the requirement of each department.