

ENSF 608 Project Proposal Student Course Registration

Team Members

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Project abstract

This project is an application to allow students to login and register for courses. It is fully functional CRUD application made with Java Spring Boot back-end and React for the front-end. This is useful because our current system for registering courses at the University of Calgary does not have an intuitive user interface and is difficult to use. This project will be made by the students, for the students.

Project scenario and goals

The end user will be a student looking to sign up for courses. The constraints we have are robustness of the backend CRUD operations and ease of use of the front end. Speed is the number one priority so we will design the user interface to encompass all operations in one page.

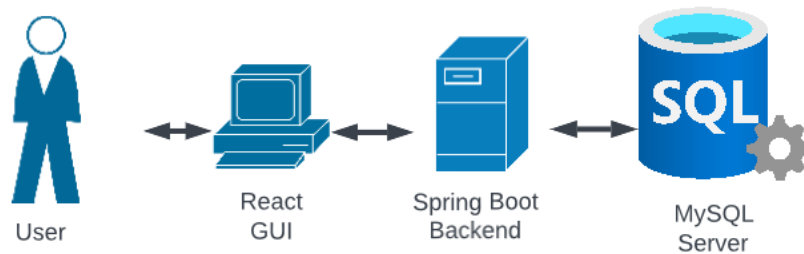


Fig.1: Data Flow Diagram

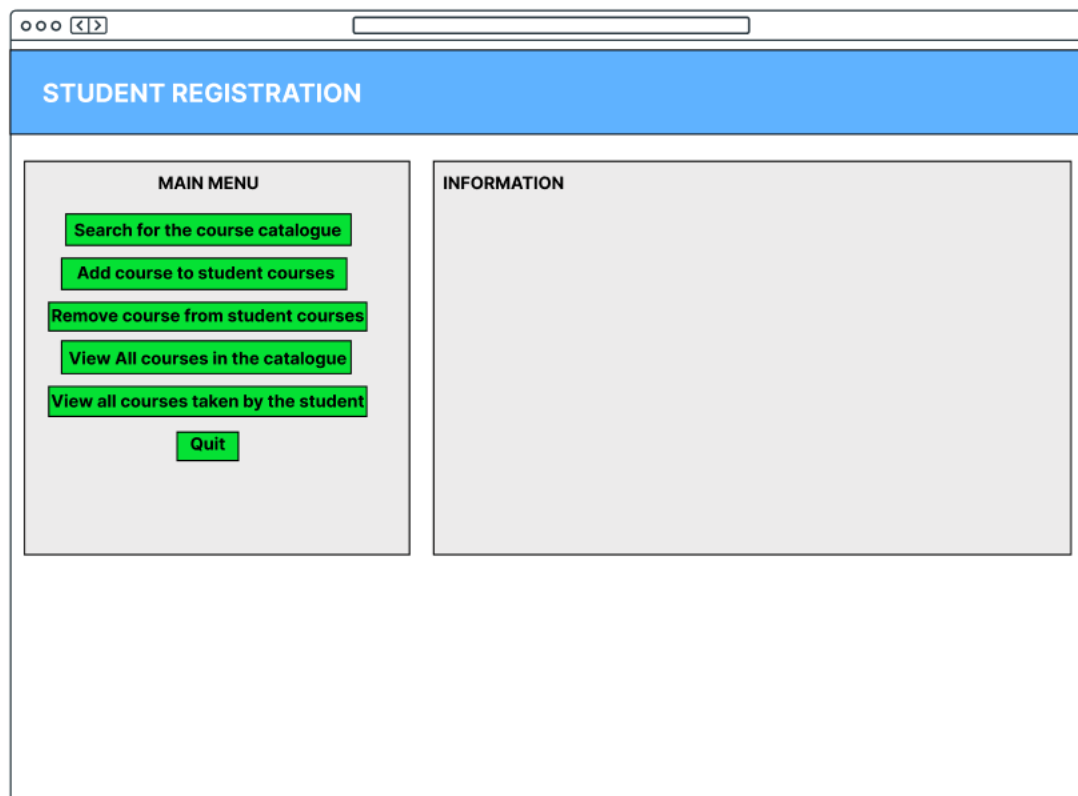


Fig.2: Basic Main Menu

Design strategy

The design will utilize SQL as a relational database to store our data. This data will be comprised from 5 tables: courses, students, prereqs, sections and enrollments.

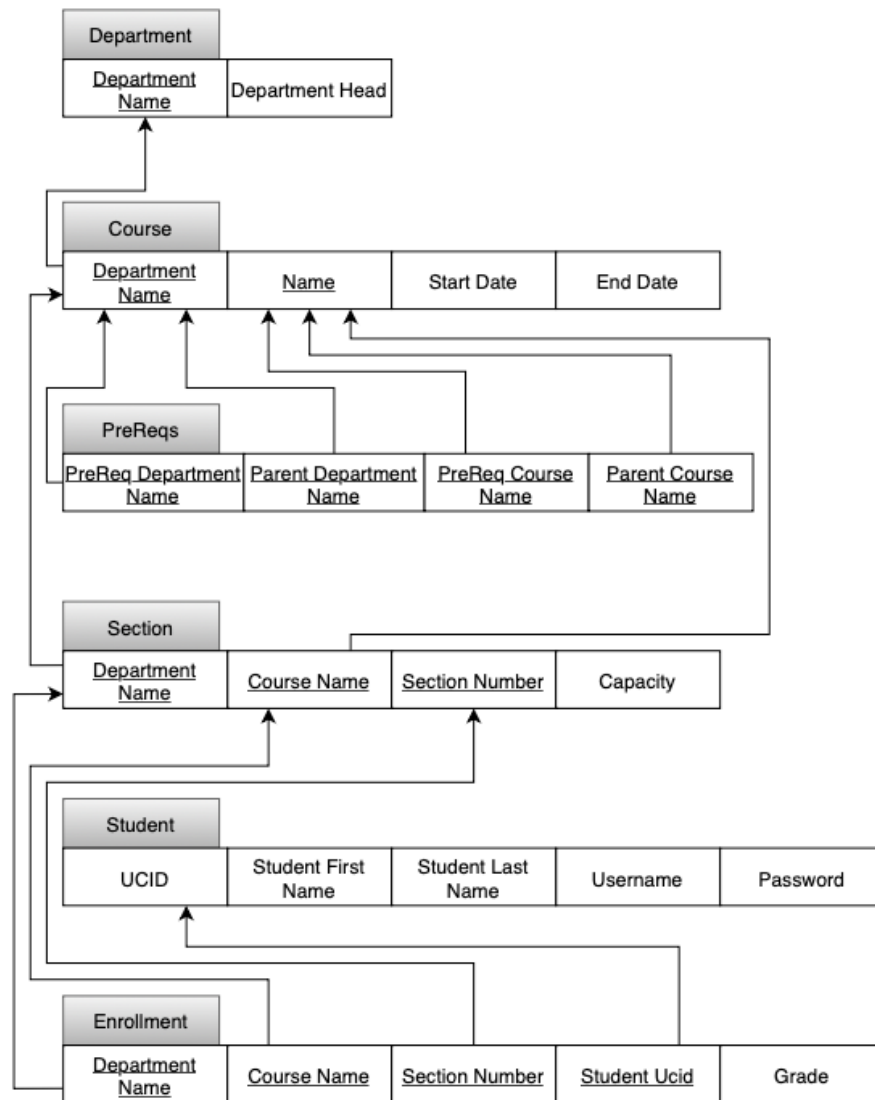


Fig.3: SQL Relationship Schema

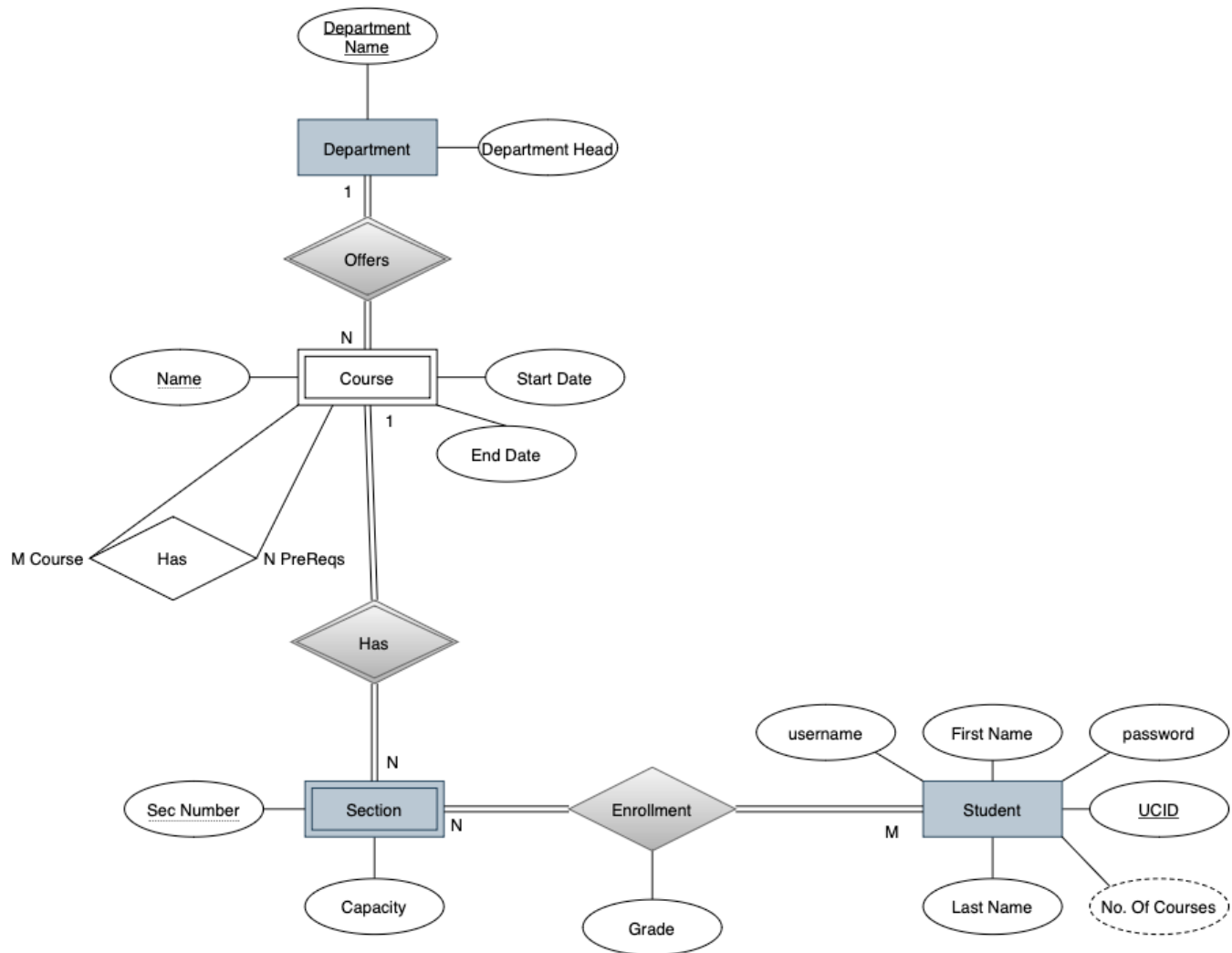


Fig.4: SQL EER Diagram

This SQL database will be controlled by the back-end which utilizes Spring Boot. The repository folder contains the java classes that interact with the database.

The backend is comprised of 4 packages which are comprised of model, repository, controller and service. These packages contain java classes which will interact with the data and relay information back to the user.

The user will interface with our front-end which is a single page web application made with React.

Design unknowns/risks

We are least familiar with React and front-end technologies in general. Other than trivial youtube tutorials, we are unfamiliar with Javascript, HTML and CSS. In terms of back-end, we are familiar with Java but not the Spring Boot framework. Database creation we are familiar with due to our coursework in ENSF608, however, the connections between the database and back-end we have no experience in.

Implementation plan and schedule

We will split the project into 3 parts. Database, back-end and front-end. Work will be done concurrently on all 3 parts of the project. It is expected that each team member will assist where needed, as needed. The steps to implementation will first be to develop an minimal viable product for the GUI to ensure test our backend through integration tests as soon as possible. If time permits, we will allocate additional time to design and integrate buttons and different pages for the user to utilize.

The database will be developed with MySQLWorkbench and will be tested with a QueryTester sql file which will test each of the CRUD operations and also investigate each table to ensure that it is created correctly. The team will work on the backend together to set up the initial database which is expected to take 2 days.

The backend will be developed with spring boot and will connect to the database. The controller classes will use the service classes which will decouple the business logic from the controller classes. The front end will connect to the backend through API endpoints. These endpoints will be tested using postman to validate the results. Mark will start programming the back-end which is expected to take 1 weeks.

The front end will be developed using the Create-React-App template. Ease of development will be critical in this application as front-end is the weakest point of our team's software development skills. The front-end will be tested with integration tests with the backend once the backend is complete. Ryan and David will start learning and programming the front-end concurrently which is expected to take 1 weeks.

The integration testing and unit tests for each component will be done in as a group to minimize miscommunication and promote teamwork through pair-programming. This is expected to take an additional week at the end of the project.

Schedule

Week 1 (Nov 15-20):

- Complete project proposal
- Complete relational schema
- Complete EER diagram
- Complete GUI design
- Start back-end
- Start front-end
- Start SQL database

Week 2 (Nov 21- Nov 27):

- Complete SQL database
- Complete back-end
- Complete basic front-end

Week 3 (Nov 28 - Dec 2):

- Testing and integration
- Validation and review of requirements
- Video Submission

Evaluation

We will evaluate our success through displaying our integration tests for the video portion of the project which will evaluate each option that can be chosen by the user. There options are as follows:

1. Populate tables for the course catalogue
2. Show all tables and explain how they are related to one another (keys, triggers, etc.)
3. A basic retrieval query
4. A retrieval query with ordered results
5. A nested retrieval query
6. A retrieval query using joined tables
7. An update operation with any necessary triggers
8. A deletion operation with any necessary triggers
9. Add and Remove course from student courses
10. View all courses in the catalogue
11. View all courses taken by the student
12. Quit

The trade-offs we will evaluate for our design decisions are speed of development versus robustness of the software.