

# **Design and Testing Document**

## **Project: Peer Review Application by Learnification Technologies**

University Of British Columbia Okanagan

COSC 499 - Summer 2023

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# 1. Description

## 1.1. Introduction

A web-based peer review application using React JS, Node Js, Express Js and for an anonymous assessment and feedback system. It promotes collaborative learning, fair evaluation, and simplifies group assignment management for faculty, enhancing the overall educational experience.

## 1.2. Purpose of the document

This document aims to describe the project design for client verification and developer reference. It includes use case models, sequence diagrams, ER diagrams, and other requirement information.

The document also provides supporting requirements, constraints, and UI guidelines. It serves as a crucial reference throughout the project, ensuring adherence to specifications and effective communication between stakeholders.

## 1.3. Mission statement

The aim is to create a collaborative learning environment that empowers students to learn from each other and promotes constructive feedback, fair assessment, and collaborative work within the academic community.

## 1.4. System Overview

The Peer Review Application is a web-based application designed to streamline and enhance the peer evaluation process in educational institutions. The objective of the application is to provide instructors and students with a user-friendly platform that enables efficient evaluation and feedback exchange.

The application consists of several key components and functionalities. It features a secure login and registration system, allowing users to create accounts and access the application.











There are two types of users in the system: students and instructors, each with their respective roles and permissions.

Upon logging in, students can view their assigned courses, assignments, and group evaluations. They can submit their assignments through the system and evaluate a set number of assignments assigned by their instructors. Additionally, students can assess other students' group contributions and receive evaluations from their peers, ensuring a fair and comprehensive evaluation process. Students have the ability to view feedback from instructors and fellow students anonymously, maintaining confidentiality.

Instructors have comprehensive control over the system. They can create assignments, define evaluation criteria, and set deadlines. They are responsible for assigning students to groups and monitoring the evaluation progress. Instructors can view and evaluate students' assignments, review group evaluations, and provide feedback. They have access to a dashboard that displays relevant details, such as assignment titles, due dates, and evaluation status, facilitating easy monitoring and tracking of student progress.

## 2. User Personas

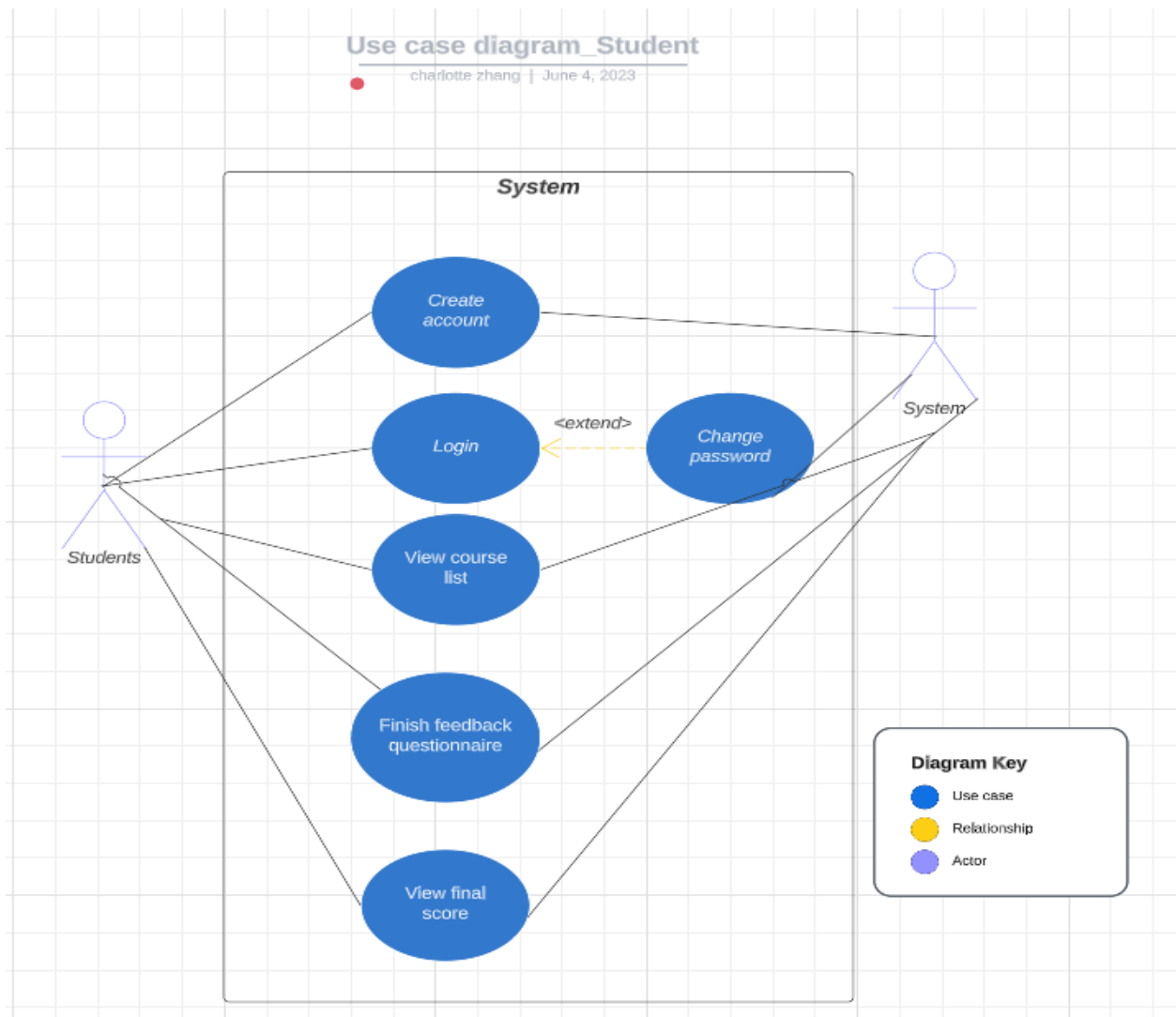
### 1. Student Persona

	<h4>Bio</h4> <p>Irene is a diligent and tech-savvy student pursuing a degree in Computer Science. She is highly motivated and takes her studies seriously. Irene values organization, efficiency, and convenience in her academic life. She is a final year student and has to do a lot of group work for her course. She is familiar with various online platforms and expects a user-friendly interface that simplifies her tasks and enhances her learning experience</p>	<h4>Pains points</h4> <ol style="list-style-type: none"><li>1. Manage to get course work done by deadline.</li><li>2. Worried if providing honest feedback would impact her work negatively</li><li>3. Receiving biased feedback/evaluation</li></ol>	<h4>Needs</h4> <ol style="list-style-type: none"><li>1. Maintaining anonymity while evaluating team members.</li><li>2. Receiving constructive feedback/evaluation on her work with proper reasoning</li></ol>
<h3>Irene Simpson</h3> <div><div><p>Age/Identifying Gender 23/Female</p></div><div><p>Location Kelowna, BC</p></div><div><p>Occupation Student</p></div><div><p>University UBCO</p></div></div>	<h4>Goals</h4> <p>(As a student)</p> <ol style="list-style-type: none"><li>1. Access assignments and relevant information easily.</li><li>2. Collaborate and evaluate team members effectively.</li><li>3. Receive timely feedbacks.</li><li>4. Monitor and track progress in courses.</li></ol>	<h4>Personality</h4> <div><div>Empathetic</div><div>Punctual</div><div>Independent</div><div>Organised</div><div>Practical</div></div>	<h4>Frequently used apps/websites</h4> <div></div>

## 2. Instructor Persona

	<b>Bio</b> <p>Dr. Ken is an experienced and dedicated instructor in the field of Computer Science. He is passionate about providing a quality education to his students and ensuring their success and has over 12 years of teaching experience. Driven by a desire to streamline administrative tasks and enhance the learning experience, he seeks an efficient and user-friendly platform that supports his teaching methodologies and assessment strategies.</p>	<b>Needs</b> <ol style="list-style-type: none"><li>1. Maintain control over course content and assessment criteria</li><li>2. Streamlined feedback management</li></ol>	<b>Pain points</b> <ol style="list-style-type: none"><li>1. Time constraint: Having to grade too many assignments for one or many classes, in his busy schedule</li><li>2. Fairly analyse and evaluate individual contribution in a team</li><li>3. Feedback/evaluation management</li></ol>
<b>Dr. David Ken</b> <div><div><p>Age/Identifying Gender 45/Male</p></div><div><p>Location Kelowna, BC</p></div><div><p>Occupation Assistant Professor</p></div><div><p>University UBCO</p></div></div>	<b>Goals</b> <p>(As an instructor)</p> <ol style="list-style-type: none"><li>1. Design and manage assignments and evaluations effectively.</li><li>2. Ensure accuracy and fairness in grading assignments</li><li>3. Facilitate effective collaboration and feedback among students</li><li>4. Analyze and extract insights from evaluation data for improvement.</li></ol>	<b>Motivations</b> <div><div>Empathetic</div><div>Punctual</div><div>Independent</div><div>Organised</div><div>Practical</div></div>	<b>Frequently used apps/websites</b> <div></div>

### 3. Use Case Diagram



Use Case 1	Create Account
Primary actor	Students
Description:	Allows a student to create an account
Pre-condition:	Students must have an email.



Post-condition:	Students get an account.
Main scenario:	<ol style="list-style-type: none"> <li>1. User presses create account.</li> <li>2. User enters an email and password.</li> <li>3. System receives requests.</li> </ol>
Extensions:	<ol style="list-style-type: none"> <li>2.1 Email validation <ol style="list-style-type: none"> <li>2.1.1 If the email address that user input does not exist, the system should show error messages.</li> </ol> </li> <li>2.2 Password setting limitation. <ol style="list-style-type: none"> <li>2.2.1 Length of password must be between 8 and 14 characters.</li> <li>2.2.2 Password must include at least one special character and upper &amp; lower case.</li> </ol> </li> </ol>

Use Case 2	Login
Primary actor	Students
Description:	Allows students to log in their account.
Pre-condition:	Users must have an account.
Post-condition:	Users successfully log in to the platform.
Main scenario:	<ol style="list-style-type: none"> <li>1. User enters an email address and password.</li> <li>2. The system will give the users access to their account</li> </ol>
Extensions:	<ol style="list-style-type: none"> <li>1.1 Email and password are not matched. <ol style="list-style-type: none"> <li>1.1.1 If the password and email entered by the user do not match the data in the database or do not exist, an error is shown.</li> </ol> </li> </ol>

Use Case 3	Change password.
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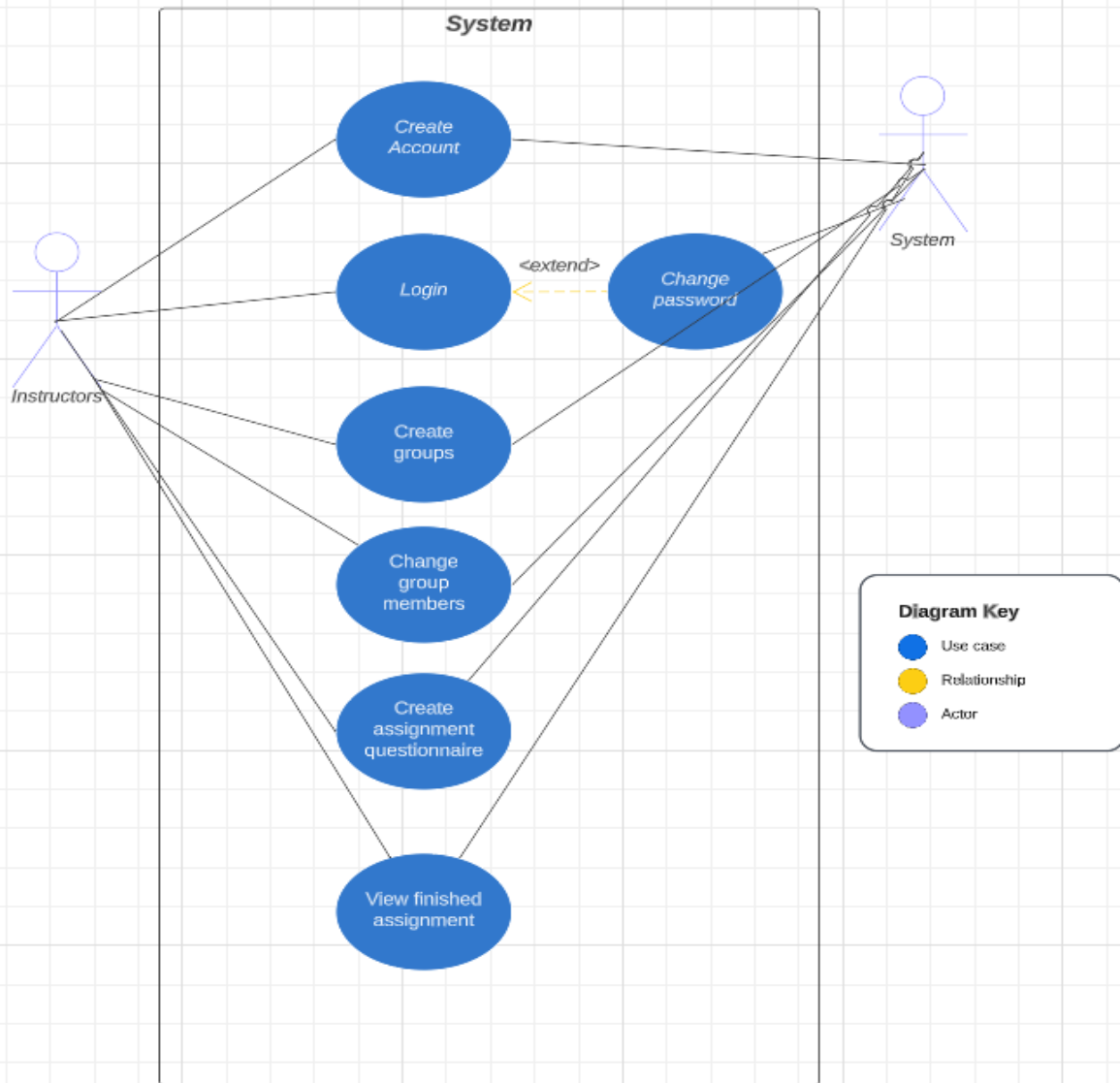
Primary actor	Students
Description:	Allows users to change their password.
Pre-condition:	The user must have an account.
Post-condition:	User password changed.
Main scenario:	<ol style="list-style-type: none"> <li>1. Users press the change password button.</li> <li>2. Users enter email and a new password.</li> <li>3. Users submit it.</li> </ol>
Extensions:	<p>2.2 Password setting limitation.</p> <p>2.2.1 Length of password must be between 8 and 14 characters.</p> <p>2.2.2 Password must include at least one special character and upper &amp; lower case.</p>

Use Case 4	View course list
Primary actor	Students
Description:	Users can view all the courses that they registered.
Pre-condition:	Users must be logged in.
Post-condition:	Users can view all the courses that they registered.
Main scenario:	<ol style="list-style-type: none"> <li>1. User go to the course list page.</li> <li>2. User waits for server to retrieve data from database.</li> <li>3. If no data returned, shows are not enrolled in any course.</li> <li>4. If data is returned, display the course information.</li> </ol>

Use Case 5	Finish feedback questionnaire
Primary actor	Students
Description:	Users can fill the questionnaires based on individual assignment or group assignment.
Pre-condition:	Users must be logged in.
Post-condition:	<ol style="list-style-type: none"> <li>1. Instructor can view the feedback that is given by the user.</li> <li>2. The group member(s) who got evaluated can see the feedback they received.</li> </ol>
Main scenario:	<ol style="list-style-type: none"> <li>1. Users select a group assignment or individual assignment for which they want to give feedback.</li> <li>2. The user selects a person who wants to give feedback.</li> <li>3. Users will provide feedback for the questions from the questionnaire anonymously.</li> </ol>

Use Case 6	View final score
Primary actor	Students
Description:	Students can view the feedback they received on group assignment or their individual assignment.
Pre-condition:	Students login to their accounts and the feedback/grade has been released by the instructor.
Post-condition:	Students gets to know their grades for individual assignments and gets feedback from other group members on their group performance.
Main scenario:	<ol style="list-style-type: none"> <li>1. Students click their grades.</li> </ol>

	2. Students can view the rubric and comments of their grades.
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Use Case 1	Create Account
Primary actor	Instructors
Description:	Allows Instructors to create an account

Pre-condition:	Instructors must have an email.
Post-condition:	Instructors get an account.
Main scenario:	<ol style="list-style-type: none"> <li>1. User presses create account.</li> <li>2. User enters an email and password.</li> <li>3. System receives requests.</li> </ol>
Extensions:	<ol style="list-style-type: none"> <li>2.1 Email validation <ol style="list-style-type: none"> <li>2.1.1 If the email address that user input does not exist, the system should show error messages.</li> </ol> </li> <li>2.2 Password setting limitation. <ol style="list-style-type: none"> <li>2.2.1 Length of password must be between 8 and 14 characters.</li> <li>2.2.2 Password must include at least one special character and upper &amp; lower case.</li> </ol> </li> </ol>

Use Case 2	Login
Primary actor	Instructors
Description:	Allows instructors to login their accounts.
Pre-condition:	The user must have an account.
Post-condition:	Users successfully log in to the platform.
Main scenario:	<ol style="list-style-type: none"> <li>1. User enters an email address and password.</li> <li>2. The system will give the users access to their account</li> </ol>
Extensions:	<ol style="list-style-type: none"> <li>1.1 Email and password are not matched. <ol style="list-style-type: none"> <li>1.1.1 If the password and email entered by the user do not match the data in the database or do not exist, an error is shown.</li> </ol> </li> </ol>

Use Case 3	Change password.
Primary actor	Instructors
Description:	Allows users to change their password.
Pre-condition:	The user must have an account.
Post-condition:	User password changed.
Main scenario:	<ol style="list-style-type: none"> <li>1. Users press the change password button.</li> <li>2. Users enter email and a new password.</li> <li>3. Users submit it.</li> </ol>
Extensions:	<p>2.2 Password setting limitation.</p> <p>2.2.1 Length of password must be between 8 and 14 characters.</p> <p>2.2.2 Password must include at least one special character and upper &amp; lower case.</p>

Use Case 4	Create groups
Primary actor	Instructors
Description:	Users can create groups.
Pre-condition:	The user must be logged in.
Post-condition:	Students are allocated to different groups.
Main scenario:	<ol style="list-style-type: none"> <li>1. The user selects a course and then group assignment that he/she wants to create the groups.</li> <li>2. The user selects the members he wants to put in the group.</li> <li>3. Users submit a CSV file that contains the group names and</li> </ol>

	respective group members.
Extensions:	4.1 Credential invalidation 4.1.1 If credentials are invalid, the User is presented with an error. 4.2 File invalid 4.2.1 If the submitted file is not a csv file then an error is shown.

Use Case 5	Edit group members
Primary actor	Instructors
Description:	Users can edit group members in groups.
Pre-condition:	The user must be logged in.
Post-condition:	Students are assigned to the group the instructor wants them to be in.
Main scenario:	1. The user can remove a person from the group members list. 2. The user can add a student to a group they would like to.

Use Case 6	Create assignment questionnaire
Primary actor	Instructor
Description:	Users can create questionnaires based on individual assignment or group assignment.
Pre-condition:	The user must be logged in.
Post-condition:	Students can view or fill questionnaires that are created by instructors.
Main scenario:	1. The user will upload a csv file that contains the type of each

	<p>question before putting it into the questionnaire. (e.g., Matrix questions, ranking questions, check box questions, MCQ and short answer questions.)</p> <p>2. The csv file will have the questions they want to add to the questionnaire</p> <p>3. Each question will also have a corresponding list of options depending on the type of questions and a list of weights associated with them..</p> <p>4. The instructor selects the deadline for group assignment or individual assignment.</p> <p>5. The group assignment evaluation form or individual assignment feedback form gets uploaded to the database and on the application.</p>
--	--

Use Case 7	View finished assignment
Primary actor	Instructors
Description:	Instructors can view the score and comments that are provided by students..
Pre-condition:	Instructors login to their accounts.
Post-condition:	Users can see non-anonymous feedback from students.
Main scenario:	<p>1. Instructors click their grades.</p> <p>2. Instructor can view how many points each question received and the comments with the student's name.</p>



## 4. System Architecture

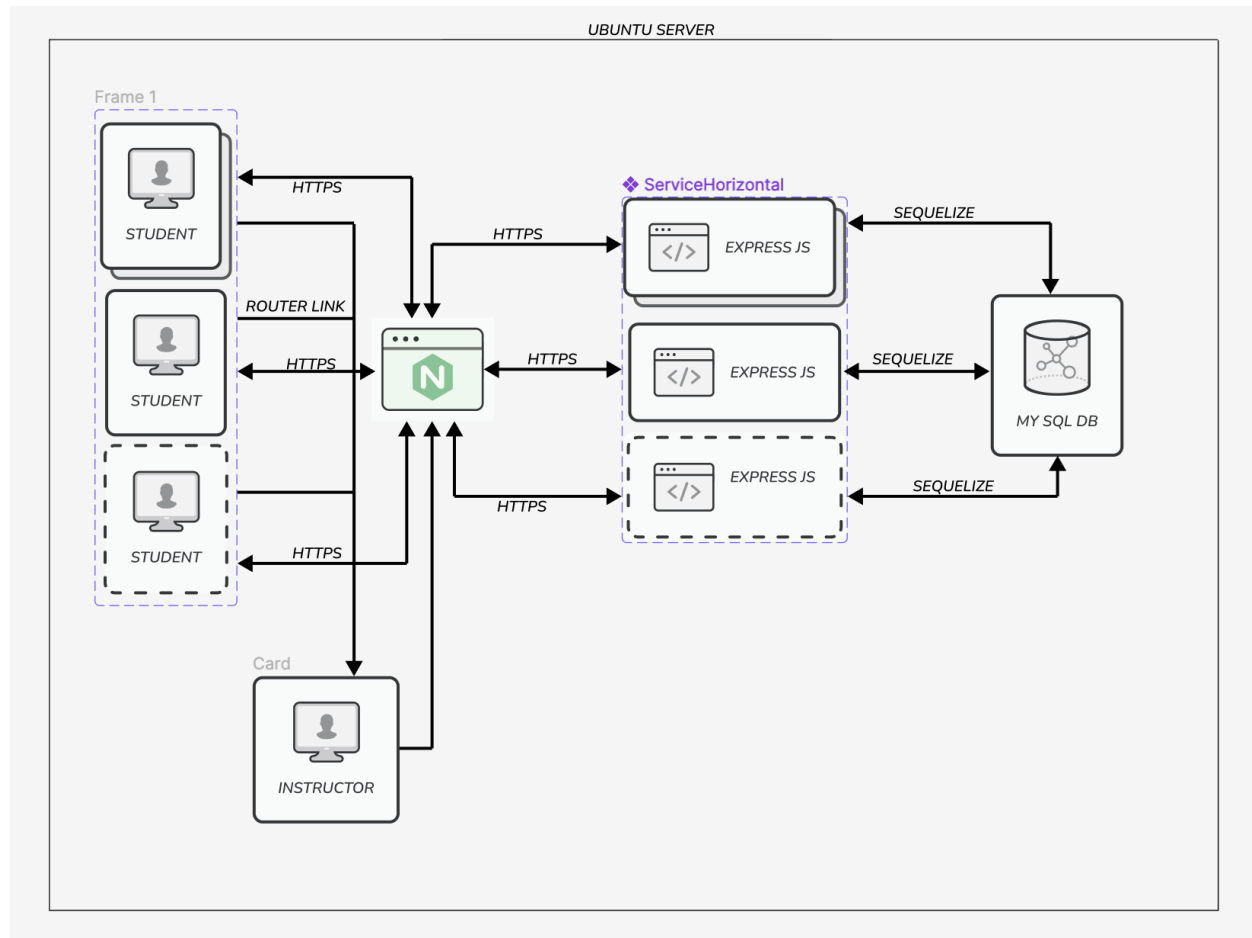


Figure 4.1

### Legend:

User : React NextJs User App

Admin : React NextJs Instructor App

Microservice - Express JS Microservices

## 4.1 MVC Framework

The Express JS microservices follow a MVC design pattern . Since our App has a frontend application , our microservices will only be returning serialized data instead of encoded HTML pages. Therefore our microservices still rely on the controller and service aspect of the MVC design model.

### 4.1.1 Controller

The controller will be js files that will receive the https requests , and parse the request to variables. Then those variables will be passed as parameters to service functions, which will perform ETL from the MY SQL on the database, and then return that data.

### 4.1.2 Service

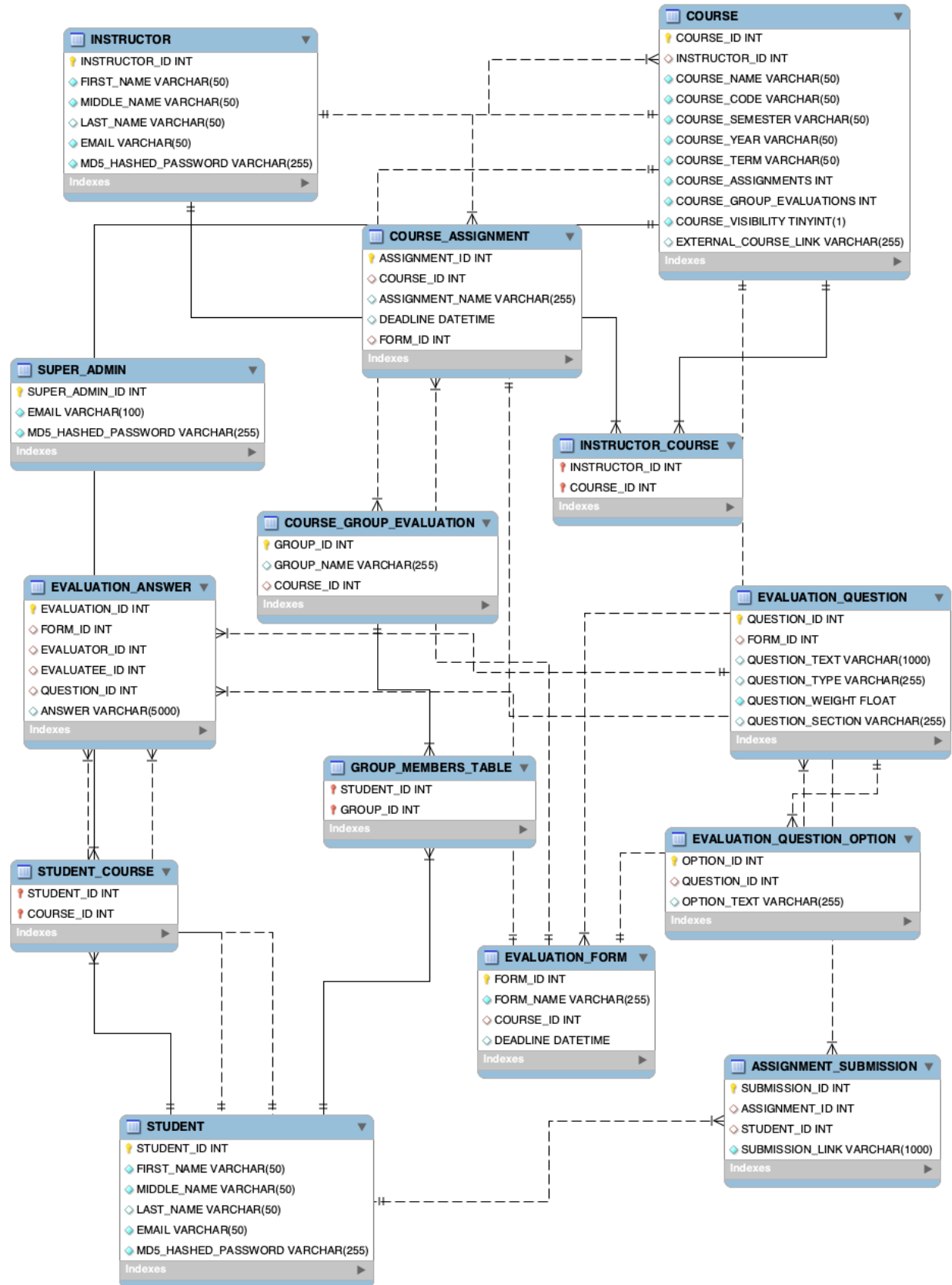
These will be JS files , that will perform ETL on the database and also map data to different new objects , that will be returned to js controllers.

## 4.2 React Next JS App

React Running with Next JS gives us faster running react applications , and also some simpler functions and UI components to build the UI.

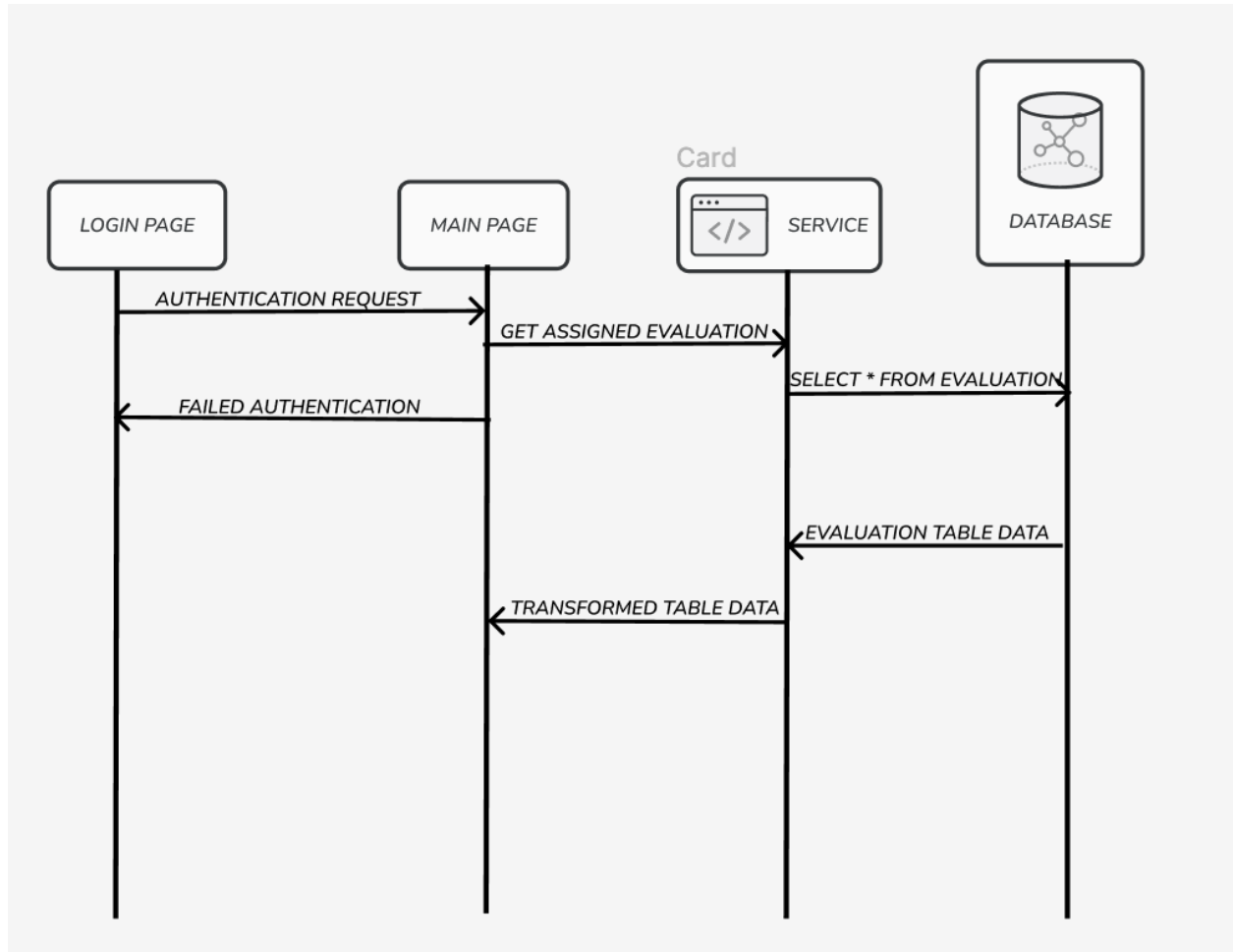
## 4.3 Database ER Diagram

This diagram shows how information will be represented as objects in a relational schema (on the next page):

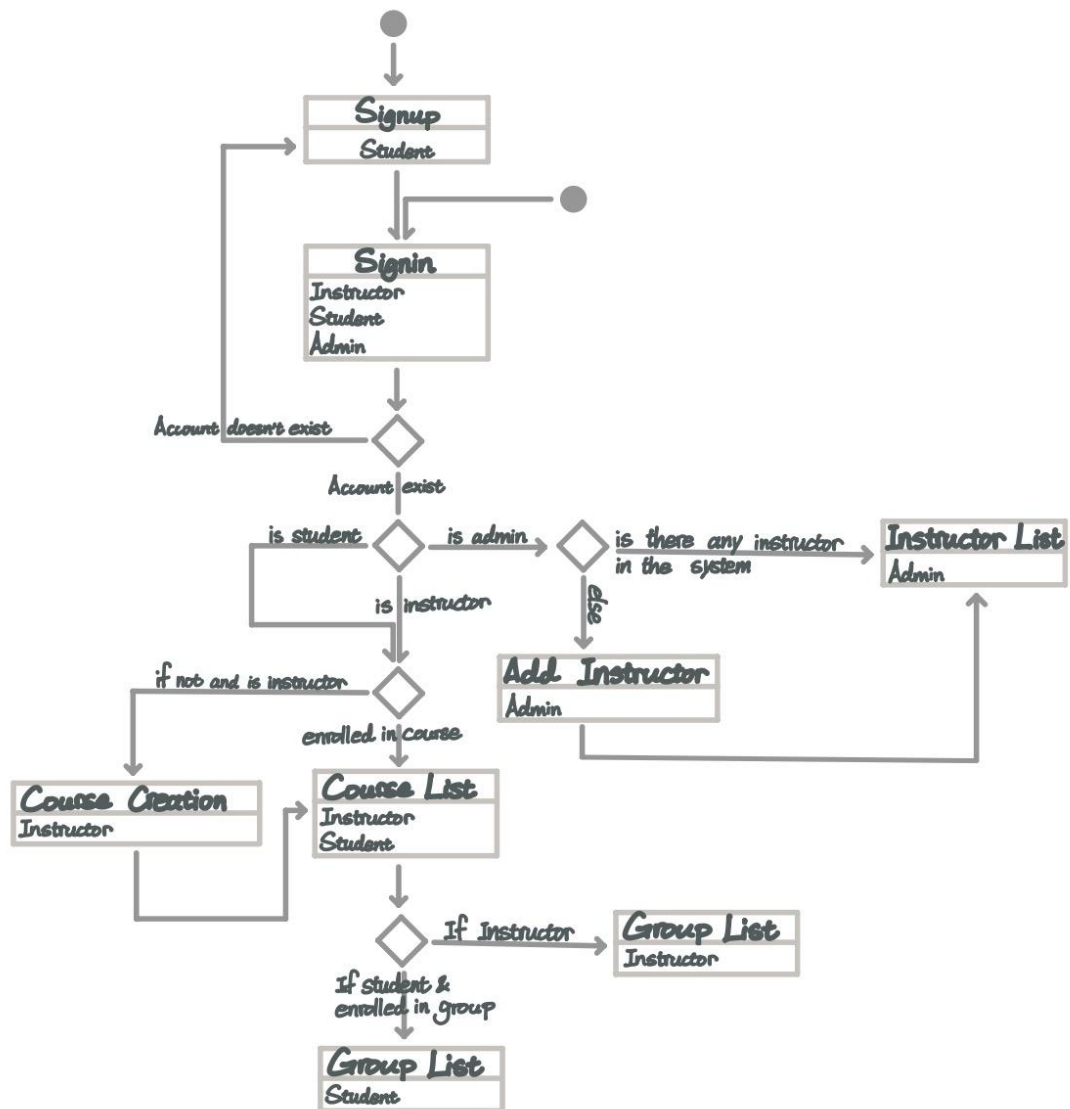


#### 4.4 Sequence diagram:


Sequence of the user interface, and the operations included in retrieving all the assigned evaluations for a student.



## 4.5 State Diagram



## 5.0 User Interface



### Sign Up

First Name \*

Middle Name

Last Name

Email \*

Student ID \*


Password \*

Confirm Password \*

[Sign Up](#)


Already have an account? [Log In](#)

Student Sign Up Page

 **Peer Review**  
by Learnification

[Dashboard](#)

[Logout](#)

Student's Name 

### Courses

COSC499 201

Summer 2021 May - August

COSC499 201

Summer 2021 May - August

COSC499 201

Summer 2021 May - August

COSC499 201

Summer 2021 May - August

COSC499 201

Summer 2021 May - August

COSC499 201

Summer 2021 May - August

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Student Dashboard

Peer Review

by Learmification

Dashboard

Logout

Name

Introduction to Programming

Student

Group

Evaluation

Student Information

Name	Middle Name	Last Name	Email	Student ID
Person A	Person A	Person A	a@gmail.com	12/12/23
Person B	Person B	Person B	a@gmail.com	12/12/23
Person C	Person C	Person C	a@gmail.com	12/12/23
Person D	Person D	Person D	a@gmail.com	12/12/23
Person E	Person E	Person E	a@gmail.com	12/12/23
Person A	Person A	Person A	a@gmail.com	12/12/23
Person B	Person B	Person B	a@gmail.com	12/12/23
Person C	Person C	Person C	a@gmail.com	12/12/23
Person D	Person D	Person D	a@gmail.com	12/12/23

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Instructor view: Course preview

## 6.0 Technical Specifications

### 6.1 Client Side

Client side uses React components , to render UI components and display the data being returned from the backend microservices. React components are a mix of



## 6.2 Server Side

The Server side Express JS app makes use of Sequelize api , to query the database. All the database tables will be stored as entities in the Microservices which will then be transformed to DTO classes , if different return type objects than the database objects are expected.

In the microservice app the controller receives the https request , then parses the request to parse extract the https request variables (body parameters, query string variables). Then sends those variables as parameters to the service methods which then make use of the Sequelize api to query the database, and return the data. The microservice app can also perform Data transformations if required .

## 6.3 MySQL Database

### **STUDENT**

- STUDENT\_ID: INT [PK] - The unique ID of the student
- FIRST\_NAME: VARCHAR(50) - The first name of the student
- MIDDLE\_NAME: VARCHAR(50) - The middle name of the student
- LAST\_NAME: VARCHAR(50) - The last name of the student
- EMAIL: VARCHAR(50) - The email address of the student (also used as login)
- MD5\_HASHED\_PASSWORD: VARCHAR(255) - The hashed password of the student

### **SUPER\_ADMIN**

- SUPER\_ADMIN\_ID: INT [PK] - The unique ID of the super admin
- EMAIL: VARCHAR(100) - The email address of the super admin
- MD5\_HASHED\_PASSWORD: VARCHAR(255) - The hashed password of the super admin

### **INSTRUCTOR**

- INSTRUCTOR\_ID: INT [PK, Auto Increment] - The unique ID of the instructor
- FIRST\_NAME: VARCHAR(50) - The first name of the instructor

- MIDDLE\_NAME: VARCHAR(50) - The middle name of the instructor
- LAST\_NAME: VARCHAR(50) - The last name of the instructor
- EMAIL: VARCHAR(50) - The email address of the instructor
- MD5\_HASHED\_PASSWORD: VARCHAR(255) - The hashed password of the instructor

## **COURSE**

- COURSE\_ID: INT [PK, Auto Increment] - The unique ID of the course
- INSTRUCTOR\_ID: INT - The ID of the instructor associated with the course
- COURSE\_NAME: VARCHAR(50) - The name of the course
- COURSE\_CODE: VARCHAR(50) - The code/identifier of the course
- COURSE\_SEMESTER: VARCHAR(50) - The semester of the course
- COURSE\_YEAR: VARCHAR(50) - The year of the course
- COURSE\_TERM: VARCHAR(50) - The term/period of the course
- COURSE\_ASSIGNMENTS: INT - The number of assignments in the course
- COURSE\_GROUP\_EVALUATIONS: INT - The number of group evaluations in the course
- COURSE\_VISIBILITY: TINYINT(1) - The visibility status of the course (0 - not visible, 1 - visible)
- EXTERNAL\_COURSE\_LINK: VARCHAR(255) - The link to an external course (optional)

## **INSTRUCTOR\_COURSE**

- INSTRUCTOR\_ID: INT - The ID of the instructor
- COURSE\_ID: INT - The ID of the course
- PRIMARY KEY (INSTRUCTOR\_ID, COURSE\_ID)
- FOREIGN KEY (INSTRUCTOR\_ID) REFERENCES INSTRUCTOR(INSTRUCTOR\_ID)
- FOREIGN KEY (COURSE\_ID) REFERENCES COURSE(COURSE\_ID)

## **STUDENT\_COURSE**

- STUDENT\_ID: INT - The ID of the student
- COURSE\_ID: INT - The ID of the course
- FOREIGN KEY (STUDENT\_ID) REFERENCES STUDENT(STUDENT\_ID)
- FOREIGN KEY (COURSE\_ID) REFERENCES COURSE(COURSE\_ID)
- PRIMARY KEY (STUDENT\_ID, COURSE\_ID)

## **COURSE\_GROUP\_EVALUATION**

- GROUP\_ID: INT [PK, Auto Increment] - The unique ID of the group evaluation
- GROUP\_NAME: VARCHAR(255) - The name of the group
- COURSE\_ID: INT - The ID of the course
- FOREIGN KEY (COURSE\_ID) REFERENCES COURSE(COURSE\_ID)

## **GROUP\_MEMBERS\_TABLE**

- STUDENT\_ID: INT - The ID of the student
- GROUP\_ID: INT - The ID of the group evaluation
- FOREIGN KEY (GROUP\_ID) REFERENCES COURSE\_GROUP\_EVALUATION(GROUP\_ID)
- FOREIGN KEY (STUDENT\_ID) REFERENCES STUDENT(STUDENT\_ID)
- PRIMARY KEY (STUDENT\_ID, GROUP\_ID)

## **EVALUATION\_FORM**

- FORM\_ID: INT [PK, Auto Increment] - The unique ID of the evaluation form
- FORM\_NAME: VARCHAR(255) - The name of the evaluation form
- COURSE\_ID: INT - The ID of the course
- DEADLINE: DATETIME - The deadline for submitting the evaluation form
- FOREIGN KEY (COURSE\_ID) REFERENCES COURSE(COURSE\_ID)

## **EVALUATION\_QUESTION**

- QUESTION\_ID: INT [PK] - The unique ID of the evaluation question
- FORM\_ID: INT - The ID of the evaluation form
- QUESTION\_TEXT: VARCHAR(1000) - The text of the evaluation question
- QUESTION\_TYPE: VARCHAR(255) - The type of the evaluation question
- QUESTION\_WEIGHT: FLOAT - The weight/importance of the evaluation question
- QUESTION\_SECTION: VARCHAR(255) - The section/category of the evaluation question
- FOREIGN KEY (FORM\_ID) REFERENCES EVALUATION\_FORM(FORM\_ID)

### **EVALUATION\_QUESTION\_OPTION**

- OPTION\_ID: INT [PK] - The unique ID of the evaluation question option
- QUESTION\_ID: INT - The ID of the evaluation question
- OPTION\_TEXT: VARCHAR(255) - The text of the evaluation question option
- FOREIGN KEY (QUESTION\_ID) REFERENCES EVALUATION\_QUESTION(QUESTION\_ID)

### **EVALUATION\_ANSWER**

- EVALUATION\_ID: INT [PK] - The unique ID of the evaluation answer
- FORM\_ID: INT - The ID of the evaluation form
- EVALUATOR\_ID: INT - The ID of the student who is evaluating
- EVALUATEE\_ID: INT - The ID of the student being evaluated
- QUESTION\_ID: INT - The ID of the evaluation question
- ANSWER: VARCHAR(5000) - The answer to the evaluation question
- FOREIGN KEY (FORM\_ID) REFERENCES EVALUATION\_FORM(FORM\_ID)
- FOREIGN KEY (EVALUATOR\_ID) REFERENCES STUDENT(STUDENT\_ID)
- FOREIGN KEY (EVALUATEE\_ID) REFERENCES STUDENT(STUDENT\_ID)
- FOREIGN KEY (QUESTION\_ID) REFERENCES EVALUATION\_QUESTION(QUESTION\_ID)

### **COURSE\_ASSIGNMENT**

- ASSIGNMENT\_ID: INT [PK, Auto Increment] - The unique ID of the assignment
- COURSE\_ID: INT - The ID of the course
- ASSIGNMENT\_NAME: VARCHAR(255) - The name of the assignment
- DEADLINE: DATETIME - The deadline for submitting the assignment
- FORM\_ID: INT - The ID of the evaluation form associated with the assignment
- FOREIGN KEY (COURSE\_ID) REFERENCES COURSE(COURSE\_ID)
- FOREIGN KEY (FORM\_ID) REFERENCES EVALUATION\_FORM(FORM\_ID)

## **ASSIGNMENT\_SUBMISSION**

- SUBMISSION\_ID: INT [PK, Auto Increment] - The unique ID of the assignment submission
- ASSIGNMENT\_ID: INT - The ID of the assignment
- STUDENT\_ID: INT - The ID of the student submitting the assignment
- SUBMISSION\_LINK: VARCHAR(1000) - The link to the submitted assignment
- FOREIGN KEY (ASSIGNMENT\_ID) REFERENCES COURSE\_ASSIGNMENT(ASSIGNMENT\_ID)
- FOREIGN KEY (STUDENT\_ID) REFERENCES STUDENT(STUDENT\_ID)

## **7.0 Test Plan/QA Plan:**

### **7.1 Goal**

The System needs to be tested at multiple points of development , to ensure that the components previously built are still working accordingly with integration of new components . Moreover the functions being built are also returning expected values that we expect them to deliver. Moreover Manual testing on the whole system needs to be done, to ensure that all the components of the system are working expectedly in a synchronous manner. The most important testing goal is to

make sure the product being delivered is in alignment with the Clients Expectations, and the requirements of the system.

## 7.2 Scope

The scope of testing will include all the backend apis and frontend interfaces of the application.

## 7.3 Out of Scope

Currently there is nothing that has been identified as out of scope to test this application. Since this application relies heavily on CRUD operations of the stored information, and basic mathematical data transformation . Current testing techstack and techniques, should be able to test all the functional requirements of the system.

## 7.3 Example test Cases that need to be tested for :

1. Student is able to Perform a peer evaluation successfully , and all his answers are recorded correctly in the database. While also making sure when the student comes back to review his evaluation, the exact same results are shown.
2. Instructor is able to create an evaluation, and all the data from the evaluation is stored in the correct manner in the database. Moreover when the evaluation is presented to students , it has the exact same data that the instructor had input into the system.
3. Dashboard Summary view of an evaluation is displaying all the values correctly , based on the right functional requirements to display the summary.

## 7.4 Testing Techniques

### 1. **Microservice testing**

All the service functions and any parsing functions will have unit tests that will test the expected outputs. If a service function relies on multiple functions to retrieve the final results , integration tests for those functions will be written to test the methods. The library used to run these tests is the Vitest library.

- a. ViTest library - Allows us to pass parameters to functions, and then compare the returned results with expected results

## **2. Database Testing**

User stories and scenarios will be used , to ensure that all the required data that needs to be stored , can be stored in the tables.

## **3. Front end Testing**

Manual testing will be performed for the UI components , while for reusable react components the react testing library will be used to store automated tests in the repo.

- a. React Testing library - Allows us to pass input variables into our react HTML components , then Verify if the rendered components values are similar to the expected value.

## **4. Manual System Testing**

Once we have an MVP ready , manual testing will be performed on the working product to test to see. All the values , and functions are working in the manner they are supposed to be working. Meaning the CRUD operations performed on the front end , are being accurately carried out on the database.

## **5. Acceptance Testing**

After the delivery of the MVP , the Client will be asked to test the functionality of the MVP product and to see that the functionality delivered is what the client was expecting.

## **7.5 Branching Strategy:**

The following branching strategy will be used for development . The dev branch is only expected to receive code from UAT , and the production branch. To ensure DEV branch always has working code, for anyone to branch out of.

All the new feature branches are only allowed to come out of the DEV or UAT (only if a bug is found) branch only. THE CI pipelines will handle the merging of the UAT branch with PROD , at set times.

