Software Requirements Specification for

SMOOTEA Learning Access & Class Enrollment System (SLACES)

Version 2.0

Prepared by

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1. Introduction (proposal)

1.1. Purpose

Due to the operational issues being experienced by SMOOTEA Academy especially in managing the enrolment of classes and access to learning using manual and disjointed processes, Smootea Learning Access & Class Enrollment System (SLACES) was created as a centralized system. The objective of this Software Requirement Specification (SRS) document is to outline the requirements and design of SLACES which is expected to eliminate the former practice of using static websites, manual verification of invoices and the use of third party applications like Facebook and WhatsApp.

SLACES will facilitate and automate the admission and access to learning contents by students and offer administrators effective tools to manage classes, invoices and materials. The system will allow introducing role-based dashboards, secure invoice code validation, and real-time progress tracking to improve the educational experience, decrease the administrative burden, and increase the efficiency of the operations of SMOOTEA Academy.

All the stakeholders in the development, implementation, and future improvement of the SLACES platform will take this SRS as a guide to ensure that the system is in line with the academy objectives of scalability, security, and professionalism in digital learning delivery.

1.2. Document Conventions

Convention	**Description**
Font Size	The header will include a font size of 12. The subheader is going to have a font size of 12. Font size 11 will be used for writing written material.
Font Type	The font used for the header, subheader and written content is Arial.
Bold	It will be used to highlight headers and subheaders, as well as focusing on some contents titles.
SRS	Stands for System Requirement Specification
DB	Stands for database
SSD	Stands for system sequence diagram

1.3. Intended Audience and Reading Suggestions

The current Software Requirements Specification (SRS) document of the Smootea Learning Access & Class Enrollment System (SLACES) is targeted mainly to the system developers, SMOOTEA Academy administrators and students. The developers must pay attention to the sections of System Requirements, Functional Requirements, and Database Design which are the technical details needed to construct, integrate, and support the system, such as data structures, user roles, and implementation of features. The administrators will find the sections of the Functional Requirements, Use Case Descriptions, and User Interface Prototype useful in guiding them on how to manage invoices, classes, materials and student enrollments as well as how to understand the working flow of the system and the administrative controls. The students are advised to consult the Functional Requirements and Use Case Descriptions to understand how to register, enroll in classes, find and use learning materials and track their progress. The document has clear headings and a well-developed table of contents to enable every reader to find the information that is most applicable to his or her role and responsibilities within the SLACES platform.

1.4. Project Scope

SMOOTEA Learning Access & Class Enrollment System is a web-based system designed to be used by SMOOTEA Academy in order to make the process of class enrollment and access to learning materials as simple as possible. The system has two main users, namely, the students who have bought online classes in the academy and the administrators who control the information about the classes and the access of the students.

The system will be an internal system by SMOOTEA Academy via a web browser where students will be able to register and access their respective classes. After registration, the students will be asked to input a unique invoice number that they received during the purchase. The system will check the code with the records that are in the database. When the information is a match, the student will be allowed to access the corresponding class information without any manual authorization by the administrator.

Under this system, the management of all classes are centralised and this leads to less administrative burden and delivery of content to the students at a faster rate. The system will cover user registration and authentication, invoice code validation, role-based access control (student and admin), administration of class and invoice records on the admin side, progress tracking and student dashboards to access the enrolled classes and digital materials. Nonetheless, integration with payment gateways, external social media APIs, automated certificate generation, and live online classes are not part of this project.

This project was developed using the Waterfall methodology, following a structured and sequential process from requirements gathering and analysis, through system design and implementation and deployment.

1.5. References

Book

Glinz, M., Loenhoud, H. van, Staal, S., & Bühne, S. (n.d.). *Handbook for the Cpre FoundationLevel according to the Ireb Standard* (First Release, Vol. 1.0.0).

John W. Satzinger, Robert B. Jackson, Stephen D. Burd. *System Analysis And Design in aChanging World* (7th edition) .

Website

Bandakkanavar, R. (2023, May 8). Software Requirements Specification document with example. Krazytech. https://krazytech.com/projects/sample-software-requirements-specificationsrs- report-airline-database

2. Overall Description

2.1. Product Perspective

The Smootea Learning Access & Class Enrollment System (SLACES) is created as an independent web-based solution that meets the specific requirements of SMOOTEA Academy internally. It is not a mere improvement or supplement to existing social media or e-commerce systems but is a complete system that would substitute the earlier manual and scattered procedures of enrolling in classes, accessing materials and managing students. Before SLACES, SMOOTEA Academy used to depend on static websites, manual verification of invoices, third-party platforms like Facebook and WhatsApp to deliver content and communicate. The approaches created inefficiencies, security issues, and absence of centralized control. SLACES is an automated and modernized system that automates and modernizes all the fundamental academic processes such as student registration, enrolling students in classes based on invoices, management of learning materials, and tracking progress. The system is much more efficient in its operation and user experience by adding secure authentication, student and admin role-based dashboards, and centralized data management. SLACES removes the administrative overhead of manual approvals and external communication, and gives immediate access to courses and resources to students and simplifies class management to administrators. The system architecture has two primary user interfaces, which are the student dashboard and the admin dashboard. They are closely connected, which gives the possibility to update in real-time and transparently manage classes, invoices, materials, and enrollments. The independent and centralized nature of SLACES enables SMOOTEA Academy to expand its educational services, guard intellectual property, and ensure uniformity in the quality-of-service delivery, which is a testament to the innovative and professional approach of the academy to online learning.

2.2. Product Features

Use Case	**Admin**	**Student**
Log In	Insert username and password to log into the system.	Insert username and password to log into the system.
Manage Classes	Create, edit, delete, and view classes; assign instructors and upload thumbnails.	No access.
Manage Invoices	Upload, edit and delete invoice records for student enrollment.	No access.
Manage Class Materials	Upload, edit, delete materials (PDF, video, links) for any class.	No access.
View Enrolled Students	View list of enrolled students, their progress, and filter by class/status.	No access.
Join New Class	No access.	Submit invoice code and email to enroll in class; access is granted if valid.
View My Classes	No access.	View list of enrolled classes, including title, instructor, progress, and access button.
Access Class Materials	No access.	View, download, and mark materials as done/undone for enrolled classes.
Track Progress	View and monitor student progress/completion for each class/material.	Mark materials as done/undone; view personal progress in dashboard.
Contact Admin	No access (unless as a support recipient).	Open WhatsApp chat or link to contact admin for help.

2.3. User Classes and Characteristics

Smootea Learning Access & Class Enrollment System (SLACES) is a system that will facilitate the two key user categories in SMOOTEA Academy, Admin and Student, with their respective roles and access rights in the learning management process.

1. Admin

Characteristics:

Admins take care of the whole system management and maintenance. They are also responsible to create, update and delete classes and materials, upload invoice records of students enrolled in the classes, track the progress of the students, manage user accounts and keep track of all the students enrolled in the classes. The advanced features available to admins include the ability to create dashboards of classes, upload materials (PDF, video, links), and analytics that can be used to monitor student engagement and completion rates.

Use Frequency:

Moderate- The admins normally communicate with the system when setting up classes, in the course of management of the material, and in regular checkups of the student enrollments and progress.

Privilege Levels:

High- Admins have complete control of system configuration, class and material management, invoice management and user management. They have full access to the modules and are able to execute important functions that influence the platform structure and data integrity.

Technical Expertise:

Moderate to Advanced-Admins need to be conversant with web-based interfaces, content management, and administration workflows. Database interactions and report generation may be needed in their activities.

2. Student

Characteristics:

Students are the main users of the system, and they register in classes through special invoice codes and get learning materials offered by the academy. Their primary activities involve creating an account, enrolling in new classes, viewing the list of classes enrolled in, course materials, progress, and reaching out to the admin in case of any issues. The students are restricted to access that is narrowly based on their enrollment and learning activities.

Use Frequency:

Regular usage - The frequent use of SLACES by students is to enroll in a class, access materials, monitor progress, and request help, particularly during active learning times.

Privilege Levels:

Limited - The students are only able to view and interact with their classes and materials, and are not able to manage classes, materials, or other users. They have limited permissions to functions that are required in learning and tracking of progress.

Technical Expertise:

Basic to Moderate - The students are supposed to know the basics of web navigation and the system usage, including registration, logging in, entering the invoice codes, and accessing the learning resources. The system is made to be user-friendly and accessible to the users who have different levels of digital literacy.

2.4. Operating Environment

Hardware

Table 2.4.1 Hardware Description

Item	**Description**
Central Processing Unit (CPU)	Intel(R) Core(TM) i5-1035G1 CPU @ 1.00GHz 1.19 GHz
Graphic Processing Unit (GPU)	Integrated Intel UHD Graphics
Solid State Drive (SSD)	KINGSTON SNV2S1000G
Random Access Memory (RAM)	12GB DDR4 (HyperX)
Power Supply	Standard laptop AC adapter, Output: 19V DC, 2.37A, 45W; Input: 100~240V AC 50/60Hz universal
Keyboard	PC/AT Enhanced PS/2 Keyboard (101/102-Key)
Mouse	Logitech wired mouse

Operating System

Table 2.4.2 Operation System Description

Item	**Description**
Window 10 and above	Version 2202 and above

Software

Item	Description
Visual Studio Code	Version 1.90
MySQL/phpMyAdmin	MySQL database with phpMyAdmin GUI
Internet Browser	Microsoft Edge / Google Chrome
Apache HTTP Server / Laragon	Local development environment
Laravel Framework	PHP backend framework
StarUML / Draw.io	Design and diagramming tools
Microsoft Word	For documentation
WhatsApp Messenger	For communication
GitHub / Git	Version control
Antivirus/Firewall	McAfee

Table 2.4.3 Software Description

2.5. Design and Implementation Constraints

Types of Constraints	Constraints
Network	- The user access to SLACES may be compromised due to irregular internet connection and delay in enrollment or downloading of material.
	- The bandwidth, particularly when uploading files of large size (PDFs, videos), could be a problem in the effective sharing of material.
Software	- Data format inconsistencies (PDF, video) or integration with external APIs (e.g., WhatsApp) may require specialized handling or skillsets.
	- The accessibility can be affected by compatibility problems between various operating systems (Windows, MacOS, mobile browsers).
	- Potential recurring license costs for third-party tools (e.g., Laravel, design tools, antivirus).
Hardware	- Limited device processing power or memory, especially on older laptops or mobile devices, can affect performance and responsiveness.
	- Outdated or restricted input/output devices (e.g., keyboard, mouse, screen size) may reduce usability for some users.
	- Devices with short battery life or overheating may require additional power management or cooling solutions for extended use.
Tools and Database	- Complex queries or advanced reporting needs may demand further optimization or migration to more powerful database solutions.
	- Current database or local server configuration could have scalability constraints that will limit expansion or growth of users in the future.

2.6. User Documentation

The Smootea Learning Access & Class Enrollment System (SLACES) has user documentation that is intended to guide students and administrators to learn how to use the platform. Users will be given comprehensive user guides on how to register, enroll into classes via invoice codes, access learning materials, monitor progress and contact support. Administrators will also be provided with separate manuals, which will be aimed at class setup, invoice management, material uploads, student progress monitoring, and administrative functions.

Besides step-by-step guidelines, Frequently Asked Questions (FAQs) will be provided to answer general questions about the account management, enrollment problems, and access to materials. To

make sure that users are familiar with the terms used on the platform, a glossary will be provided that will explain the terms and roles specific to the system. Troubleshooting will provide answers to common issues that may arise during the log in process, enrollment or downloading of materials.

There will be user interface guidelines and navigation hints that will make the users get acquainted with the dashboard designs and major functions. All the documentation materials will be presented in an online help portal, downloadable PDF guides, and brief video tutorials, according to the SMOOTEA Academy level of clarity and accessibility. These resources are meant to facilitate an easy onboarding process and future support of all SLACES users.

2.7. Assumptions and Dependencies

The SLACES's performance is dependent on a few basic assumptions and external conditions. Assumptions are things we assume to happen, such as the availability of certain devices and the fact that communication follows established standards. Dependencies occur when we rely on other resources, such as specialized databases or delivery services. Clearing out these assumptions and dependencies ensures that the system functions well for Smootea. More information about them is provided below:

- Assumed that every user (students and administrators) will be connected to the internet with a stable connection and enough server resources to facilitate user registration, enrolling in classes and accessing learning materials. System access could be interfered with by any network interruptions or server downtimes, which could affect learning processes.

- The system will rely on the stable hardware and software infrastructure, such as the current laptops/desktops, compatible operating system, and the functioning backend server/database (e.g., MySQL, phpMyAdmin, Laravel). Performance and user experience can be affected by technical failures or outdated devices.

- Presumes that every user will input data correctly and consistently, such as the correct email addresses, invoice codes and classes. Improper or variable data entry can lead to enrollment errors, access problems or tracking of progress.

- The academic records should be updated regularly and with integrity, including invoice lists, class details and uploaded materials, as the success of the system will rely on it. The lack of or old data may hinder the enrollment and access to class

materials by the students.

- SLACES presupposes the compatibility with the organizational policies of SMOOTEA Academy, such as the data privacy, access control, and intellectual property management. The system configuration or workflows might need to be changed in case of any changes in these policies.

- The system depends on the external resources like third-party tools (e.g., WhatsApp integration to support), web browsers, and antivirus solutions. These resources may have interruptions, incompatibility, or policy change, which can affect the system operation.

These assumptions and dependencies need to be clarified and monitored to ensure reliable, secure, and effective learning management to all users.

3. System Features (use case + description)

3.1 Use Case Diagram

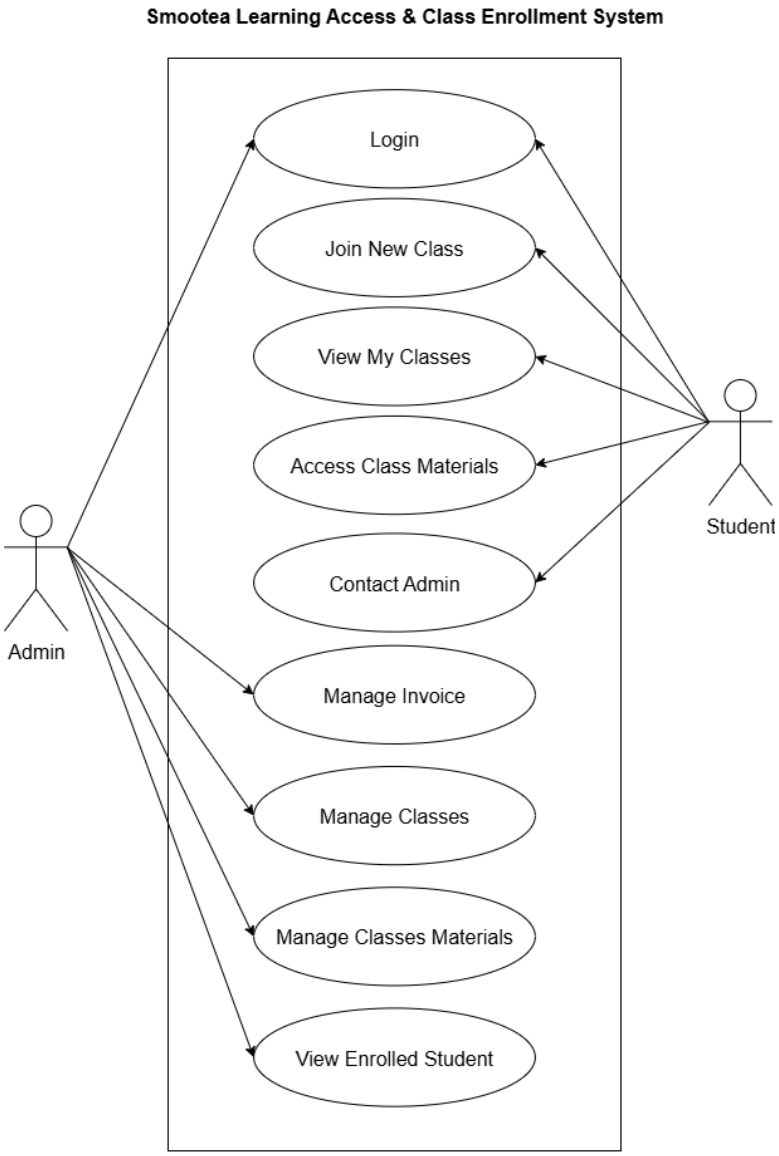

Figure 3.1.1 Use Case Diagram

3.2 Use Case Description

The Use Case Description describes the interactions of the users and the system in details of each functional requirement. It explains the situations where the users (students and admins) will interact with the system to carry out certain tasks. Every use case contains the goal, the sequence of actions, players, the system response, and exceptions to provide a complete picture and traceability of system functions.

Table 3.2.1 Use Case Description Login

Use Case ID	UC-B01	
Created By	Nur Syafika Alya	
Use Case Name	Login	
Scenario	A user (student or admin) wants to log into the system to access their dashboard.	
Triggering Event	User clicks the "Login" button from the landing page.	
Brief Description	This function allows users who have registered to log in using their email and password. Based on their role (student or admin), they will be redirected to the appropriate dashboard.	
Actor	Student / Admin	
Related Use Case	Join New Class, View My Classes	
Stakeholder	Admin and Student	
Pre-Conditions	User must be registered in the system. Login form must be accessible.	
Post Conditions	User is authenticated and redirected to their respective dashboard.	
Flow Activities	ACTOR	SYSTEM
	1.0 User clicks on the Login button. 1.3 User submits the form.	1.1 System displays the login form 1.4 System validates the credentials. [E1: Invalid Credentials] 1.5 If valid, system identifies user role. 1.6 System redirects user to corresponding dashboard.
Exceptions Conditions	[E1: Invalid Credentials] System will display “Invalid email or password” if the login fails.	
Special Requirements	• The system must support role-based redirection upon login. • Passwords must be encrypted and securely stored.	
Assumptions	• User accounts are already created in the system. • Roles are assigned during or after registration	

Notes and Issues	-

Table 3.2.2 Use Case Description Join Class

Use Case ID	UC-S01	
Created By	Nur Syafika Alya	
Use Case Name	Join New Class	
Scenario	A student who has already purchased a class wants to enter their invoice code to join and access the class.	
Triggering Event	Student clicks “Join New Class” and submits invoice code.	
Brief Description	This function allows a student to enroll in a class using a unique invoice number received during purchase. If the code and email match a record in the system, the student is enrolled in the class.	
Actor	Student	
Related Use Case	Login	
Stakeholder	Student, Admin	
Pre-Conditions	User must be logged in and use the same email as in their invoice. The invoice data must already be uploaded by the admin.	
Post Conditions	Student is enrolled in the class and the class will appear in their dashboard.	
Flow Activities	ACTOR	SYSTEM
	1.0 Student navigates to “Join New Class”	
		1.1 System displays the invoice code input form.
	1.2 Student enters their invoice number.	
	1.3 Student submits the form.	
		1.4 System checks if the invoice exists.
		1.5 System checks if the invoice matches student’s email.
		1.6 If valid, system links the student to the class. [E1: Invalid Code] [E2: Code Already Used]
		1.7 System redirects to student dashboard with class now visible.
Exceptions Conditions	[E1: Invalid Code] – System displays error “Invoice not found or mismatched email.” [E2: Code Already Used] – System displays “This code has already been used.”	
Special Requirements	• Each invoice number can only be used once and is tied to a specific email.	

	• Email entered during registration must match the one used in payment.
Assumptions	• Admin has uploaded invoice data beforehand. • Student is using the correct email used during class purchase.
Notes and Issues	-

Table 3.2.3 Use Case Description View My Classes

Use Case ID	UC-S02	
Created By	Nur Syafika Alya	
Use Case Name	View My Classes	
Scenario	A student wants to view all classes they are currently enrolled in.	
Triggering Event	Student logs in and clicks on “My Classes” from the dashboard.	
Brief Description	This function allows the student to see a list of classes they are enrolled in, along with basic information such as title, progress and access button	
Actor	Student	
Related Use Case	Join New Class, Access Class Materials	
Stakeholder	Student	
Pre-Conditions	User must be logged in and already enrolled in at least one class.	
Post Conditions	System displays a list of all classes the student has joined.	
Flow Activities	ACTOR	SYSTEM
	1.0 Student logs in and accesses the dashboard.	
		1.1 System fetches enrollment data for the logged-in user.
	1.2 Student clicks on “ Classes”.	
		1.3 System filters all classes linked to the student. [E1: No Enrollment Found] – System displays “You are not enrolled in any class yet.”
	1.5 Student clicks “View Class” to open specific class.	
		1.4 System displays list of class cards showing title, instructor, and “View Class” button.
		1.6 System redirects to class content page.
Exceptions	[E1: No Enrollment Found] – System displays “You are not	

Conditions	enrolled in any class yet.”
Special Requirements	• Display should be clear and mobile-friendly. • Each class card should include course title and instructor. • View Class button must only be active for enrolled classes.
Assumptions	• Enrollment data has been created correctly via valid invoice. • User is assigned student role.
Notes and Issues	-

Table 3.2.4 Use Case Description Access Class Materials

Use Case ID	UC-S03	
Created By	Nur Syafika Alya	
Use Case Name	Access Class Materials	
Scenario	A student wishes to view and interact with learning content for a specific class they are enrolled in, including marking materials as done for progress tracking.	
Triggering Event	Student clicks the “View Class” button from their class list.	
Brief Description	This function allows the student to access all learning materials (PDFs, videos, links) associated with their enrolled class, and to mark individual materials as done to track their progress and update their completion percentage.	
Actor	Student	
Related Use Case	View My Classes	
Stakeholder	Student, Admin	
Pre-Conditions	• Student must be logged in. • Student must be enrolled in the selected class. • Materials must have been uploaded by admin. • Enrollment and material relationships must exist in the database.	
Post Conditions	• Student successfully views or downloads class materials. • Student can mark materials as done/undone, affecting their progress. • Progress/completion percentage is recalculated and reflected in dashboard and admin views. • Enrollment status may be updated (pending/active/completed).	
Flow Activities	ACTOR	SYSTEM
	1.0 Student clicks on “My Classes”.	
		1.1 System loads the list of classes the student is enrolled in. [E2: Unauthorized Access] – System blocks access if the student is not enrolled in the class.
	1.2 Student clicks on “View Class” for a class.	

		1.3 System fetches and displays the class content page. [E1: No Materials Available] – System displays "No materials have been uploaded for this class."
	1.4 Student selects a material (e.g. PDF, video, link) to view.	
		1.5 System loads and displays/serves the selected file or link (download/preview/external redirect).
	1.6 Student clicks "Mark as Done" for a material.	
		1.7 System records completion in progress table, sets completed=true, stores timestamp. Recalculates completion percentage for class, updates enrollment status (pending, active or completed if 100%) and displays visual feedback. [E3: Invalid Marking Request] – System rejects marking/unmarking if material or enrollment is not found.
	1.8 Student may click "Mark as Undone" to revert.	
		1.9 System removes completion record for the material, recalculates completion percentage, updates enrollment status accordingly.
Exceptions Conditions	[E1: No Materials Available] - System displays "No materials have been uploaded for this class." [E2: Unauthorized Access] - System blocks access if the student is not enrolled in the class. [E3: Invalid Marking Request] - System rejects marking/unmarking if material or enrollment is not found.	
Special Requirements	• Only students enrolled in the class may access or mark materials. • All progress/completion must be tracked per material and per class.	
Assumptions	• Admin has uploaded and published the class materials in advance.	

	• All file URLs and links are valid and accessible. • User authentication and enrollment checks are handled by the backend. • Completion status and progress are visible to both student and admin.
Notes and Issues	Progress and status changes are reflected instantly in dashboard and admin views.

Table 3.2.5 Use Case Description Contact Admin

Use Case ID	UC-S04	
Created By	Nur Syafika Alya	
Use Case Name	Contact Admin	
Scenario	A student needs help and wants to contact SMOOTEA admin directly via WhatsApp.	
Triggering Event	Student clicks on the “Contact Admin” or WhatsApp icon from the dashboard.	
Brief Description	This function allows a student to open a direct WhatsApp chat with the SMOOTEA admin. It removes the need to search for phone numbers manually or use a chatbot.	
Actor	Student	
Related Use Case	None	
Stakeholder	Student, Admin	
Pre-Conditions	Student must be logged in. Admin’s WhatsApp number must be correctly set in the system.	
Post Conditions	WhatsApp (or WhatsApp Web) opens in a new tab with the admin’s contact ready to chat.	
Flow Activities	ACTOR	SYSTEM
	1.0 Student logs into the system. 1.2 Student clicks “Contact Admin”.	1.1 System loads dashboard with WhatsApp contact button. 1.2 System opens WhatsApp chat using wa.me link (e.g. wa.me/601……). [E1: WhatsApp not installed (mobile)] [E2: Invalid admin number] [E3: Admin number is not registered to Whatsapp]
Exceptions Conditions	[E1: WhatsApp not installed (mobile)] – Redirect fails or user is prompted to use WhatsApp Web. [E2: Invalid admin number] – If the number is wrongly formatted, the redirect fails. [E3: Admin number is not registered to Whatsapp] – If the number is not registred to whatsapp “invite number to Whatsapp” will show up.	
Special	• Button must be clearly visible on dashboard.	

Requirements	• No login or verification is required to chat (external app opens). • WhatsApp link must be encoded properly.
Assumptions	• WhatsApp is available on the user's device (or browser supports it). • Student is using a valid internet connection.
Notes and Issues	-

Table 3.2.6 Use Case Description Manage Invoices

Use Case ID	UC-A01	
Created By	Nur Syafika Alya	
Use Case Name	Manage Invoices	
Scenario	Admin wants to upload, edit or delete invoice data to allow student enrollment using valid invoice codes.	
Triggering Event	Admin navigates to the "Invoices" section from the sidebar.	
Brief Description	This function allows the admin to manage invoice records by uploading records manually. Each invoice links an invoice number, a student email, and a specific class.	
Actor	Admin	
Related Use Case	View Enrolled Students	
Stakeholder	Admin, Student	
Pre-Conditions	Admin must be logged in. Classes must already exist in the database.	
Post Conditions	Invoice records are created, updated, or deleted. Students with matching emails can now enroll using valid codes.	
Flow Activities	ACTOR	SYSTEM
	1.0 Admin clicks on "Manage Invoices".	
		1.1 System displays a list of current invoices and action buttons.
	1.2 Admin clicks "Add Invoice".	
		1.3 System shows form to input: invoice number, email and class, amount and invoice status as unused.
	1.3 Admin submits invoice form.	
		1.5 System validates fields and saves to database. [E1: Missing Required Fields]
	1.6 Admin clicks "Edit" for existing row.	
		1.7 System loads record into form for editing.
	1.8 Admin clicks "Delete" for an invoice.	
		1.9 System confirms and deletes invoice from database.

Exceptions Conditions	[E1: Missing Required Fields] – System shows validation errors.
Special Requirements	• Email in invoice must match what student will use during registration. • Each invoice code can only be used once. • Class ID must exist in class table.
Assumptions	• Admin has invoice data ready in correct format. • Admin checks accuracy before upload. • Admin set new user invoice as unused.
Notes and Issues	-

Table 3.2.7 Use Case Description Manage Classes

Use Case ID	UC-A02	
Created By	Nur Syafika Alya	
Use Case Name	Manage Classes	
Scenario	Admin wants to create a new class, edit existing class details, or delete a class from the system.	
Triggering Event	Admin clicks on “Manage Classes” from the sidebar.	
Brief Description	This function enables the admin to view and perform CRUD (Create, Read, Update, Delete) operations on class records and choose between grid view (card-style) or list view (table-style) for better usability. Each class contains a title, description, status and thumbnail.	
Actor	Admin	
Related Use Case	Manage Invoices, Manage Class Materials, View Enrolled Students	
Stakeholder	Admin, Students	
Pre-Conditions	Admin must be logged in. System must be connected to the database.	
Post Conditions	• Classes are listed and managed according to admin’s actions. • View mode (grid or list) is toggled and persists for session. • Changes to classes are reflected system-wide.	
Flow Activities	ACTOR	SYSTEM
	1.0 Admin clicks “Manage Classes”.	
		1.1 System displays a list of existing classes with options to add, edit, view, or delete. Provides toggle for grid or list view.
	1.2 Admin chooses to toggle view (grid or list).	
		1.3 System switches display mode and remember choice (session/local storage).
	1.4 Admin clicks “Add New Class”.	
		1.5 System opens a form to

		input class title, description, status, and thumbnail.
	1.6 Admin fills in the form and submits.	
		1.7 System validates the fields. [E2: Missing Fields]
		1.8 System saves the new class to the database and refreshes the class list. [E1: Duplicate Class Title]
	1.9 Admin clicks “Edit” for a class.	
		1.10 System loads the class data into an editable form.
	1.11 Admin updates and submits changes.	
		1.12 System validates and saves edits to the database, then refreshes the class list. [E2: Missing Fields]
	1.13 Admin clicks “Delete” for a class.	
	1.15 Admin clicks “View” for a class.	1.14 System prompts for confirmation, then removes the class and updates the list.
		1.16 System displays class details, including enrolled students and materials.
Exceptions Conditions	[E1: Duplicate Class Title] - System displays “Class title already exists.” [E2: Missing Fields] - System shows error if any field is left empty.	
Special Requirements	• Title and instructor fields are mandatory. • Description field can be optional or short. • System should confirm deletion to prevent accidental loss.	
Assumptions	• Admin understands which instructor is assigned to which class. • Class data is used in other modules (e.g., material upload).	
Notes and Issues	Alternative: • Grid View: Classes shown as cards (thumbnail, title, status, actions). • List View: Classes shown in table/list (columns for ID, title, status, date, students, actions).	

	• Toggle: Admin can switch anytime; system updates UI and remembers preference.

Table 3.2.8 Use Case Description Manage Class Materials

Use Case ID	UC-A03	
Created By	Nur Syafika Alya	
Use Case Name	Manage Class Materials	
Scenario	Admin wants to upload, update, or delete learning materials for specific classes.	
Triggering Event	Admin clicks “Materials” and selects a class to manage its materials.	
Brief Description	This use case enables the admin to manage class materials such as video files, PDFs, or links. Each material is assigned to a class and tagged by type. Admin can also preview, filter, or edit existing content.	
Actor	Admin	
Related Use Case	Manage Classes	
Stakeholder	Admin, Student	
Pre-Conditions	Admin must be logged in. Class must already be created. Materials must be linked to existing classes.	
Post Conditions	Learning materials are available for students enrolled in that class.	
Flow Activities	ACTOR	SYSTEM
	1.0 Admin clicks “Materials”.	1.1 System displays list of materials.
	1.2 Admin clicks “Upload New Material”.	1.3 System opens material upload form.
	1.4 Admin fills out the form (title, type, file/link, description). [E2: Invalid File Type]	1.6 System validates fields and saves material. [E1: Missing Required Fields]
	1.5 Admin submits material form.	1.8 System loads material data into form.
	1.7 Admin clicks “Edit” for a material.	1.12 System confirms and removes material.
	1.9 Admin updates and submits.	
	1.10 System saves changes.	
	1.11 Admin clicks “Delete” for a material.	

Exceptions Conditions	[E1: Missing Required Fields] – System shows validation errors. [E2: Invalid File Type] – System blocks unsupported uploads.
Special Requirements	• Each material must be assigned to a valid class. • System must support file previews and material type filtering. • System should confirm deletions.
Assumptions	• Admin understands the type of content each class requires. • Files are within size limits and properly labeled.
Notes and Issues	-

Table 3.2.9 Use Case Description View Enrolled Students

Use Case ID	UC-A04	
Created By	Nur Syafika Alya	
Use Case Name	View Enrolled Students	
Scenario	Admin wants to view the list of enrolled students, their associated classes, enrollment status, and course completion percentage.	
Triggering Event	Admin selects the “Enroll Students” option from the sidebar/dashboard.	
Brief Description	This use case allows the admin to view and filter enrolled students by class and status. Admin can view student details including name, email, class name, status and completion progress.	
Actor	Admin	
Related Use Case	Manage Invoices, Manage Classes	
Stakeholder	Admin, Student	
Pre-Conditions	Admin must be logged in. Enrollment data must already exist. Students must have successfully submitted valid invoice codes.	
Post Conditions	Admin views enrollment list.	
Flow Activities	ACTOR	SYSTEM
	1.0 Admin clicks on “Enroll Students”.	
		1.1 System loads the list of all enrolled students. [E1: No Students Enrolled]
	1.2 Admin searches or filters by class/status.	
		1.3 System updates the list based on the selected filter.
	1.4 Admin clicks the “View” button beside a student.	
		1.5 System displays detailed information (name, email, class, completion status and other class enrolled).
Exceptions Conditions	[E1: No Students Enrolled] – System displays “No students have joined this class yet.”	
Special Requirements	• Only admin has access to this screen.	
Assumptions	• Students are already properly enrolled via invoice code.	

	• Admin uses this feature for verification and correction only.
Notes and Issues	-

4.0 External Interface Requirements

4.1. User Interfaces

The Smootea Learning Access & Class Enrollment System (SLACES) incorporates an easy-to-use web interface, which is intended to serve both the administrators and the students. The administrator dashboard offers easy to use functions to manage classes, upload materials, manage invoices, and track student enrollments and progress. The interface is clean and gives students the option to register, enroll in classes by using an invoice code, access course materials, mark progress and contact support. This system structure is based on explicit navigation menus, role-specific dashboards, and responsive design to be accessible through desktops, laptops, and mobile devices. Constructed using Laravel and being operated on Laragon, the interface will facilitate the simplicity of use among all stakeholders and facilitate the centralization of academic activities.

4.2. Hardware Interfaces

SLACES will communicate with a variety of hardware systems such as personal computers, laptops, network hardware (Wi-Fi routers, switches), and server infrastructure. The application and database are deployed on local or cloud-based servers and can be accessed using standard operating systems such as windows 10 and above. The CRUD and the relational data management are executed through the links to MySQL databases. Communication with networking hardware is done on standard protocols (e.g., TCP/IP), which makes data transfers reliable. Basic input/output peripherals like keyboard and mouse are needed to navigate the system using end user devices and the devices should support modern web browsers.

4.3. Software Interfaces

The platform incorporates various software tools to work in harmony with one another. Backend is developed using Laravel framework, and is deployed on Laragon development environment, and uses Apache HTTP Server and MySQL (through phpMyAdmin) to manage databases. The system will interact with web browsers (Microsoft Edge, Google Chrome) in order to access the user, and potentially third-party tools (e.g. WhatsApp, GitHub, Draw.io, StarUML) to assist and design. Data flows are user authentication requests, enrollment records, material uploads,

and transaction logs. Outgoing messages include enrollment confirmation, progress messages, and system messages.

4.4. Communications Interfaces

The SLACES platform utilizes secure and dependable communication protocols to facilitate efficient interaction between the users and back-end services. The web application can be reached through the main domain `jomcloud.com`, and it uses HTTPS protocols to secure data transmission with encryption. Responsive electronic forms and real-time notifications are used to facilitate user actions, including registration, class enrollment and material access, thus improving usability and reliability. The backend communication is enabled through RESTful APIs that enable the exchange and synchronization of data between the server, database and client browsers. Learning materials and file uploads and downloads are done through secure connections to avoid unauthorized access. The data backups, as well as continuous server monitoring, further ensures the integrity of information, whereas the optimized data transfer rates ensure a smooth user experience even at the peak times. Every interface meets the current standards of security and organizational policies and ensures a stable and reliable access to all users.

4.5 System Interfaces

The User Interface prototype of the Smootea Learning Access & Class Enrollment System is a visual of the main functions of the proposed system. It offers stakeholders a preview of the user interface and feature flow of the system early enough, where they can evaluate and validate it before it is implemented. The prototype is based on core modules which include student registration, joining classes, accessing class content and admin controls like invoice management and material management.

Landing Page

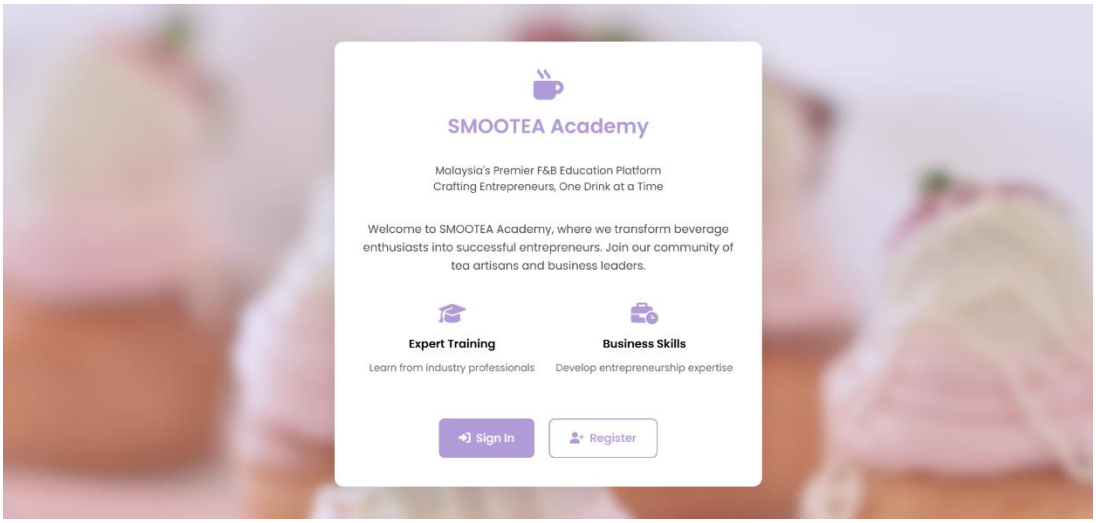

Figure 4.5.1 Landing Page

The landing page introduces users to SLACES, featuring options to register or log in.

Register Page

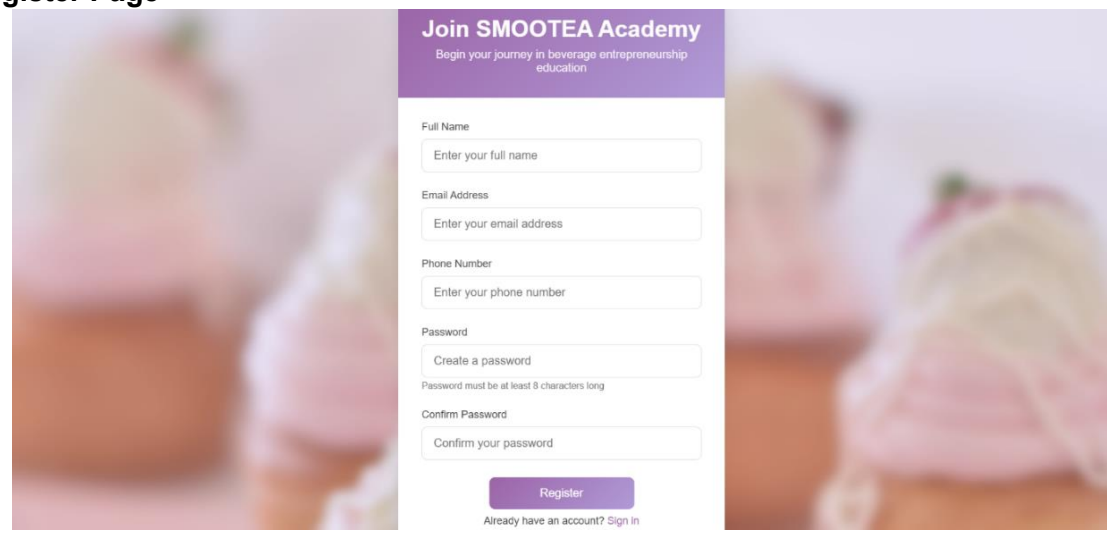

Figure 4.5.2 Register Page

Registration form for new users, requiring name, email, and password. The system validates inputs and ensures email uniqueness before account creation.

Login Page

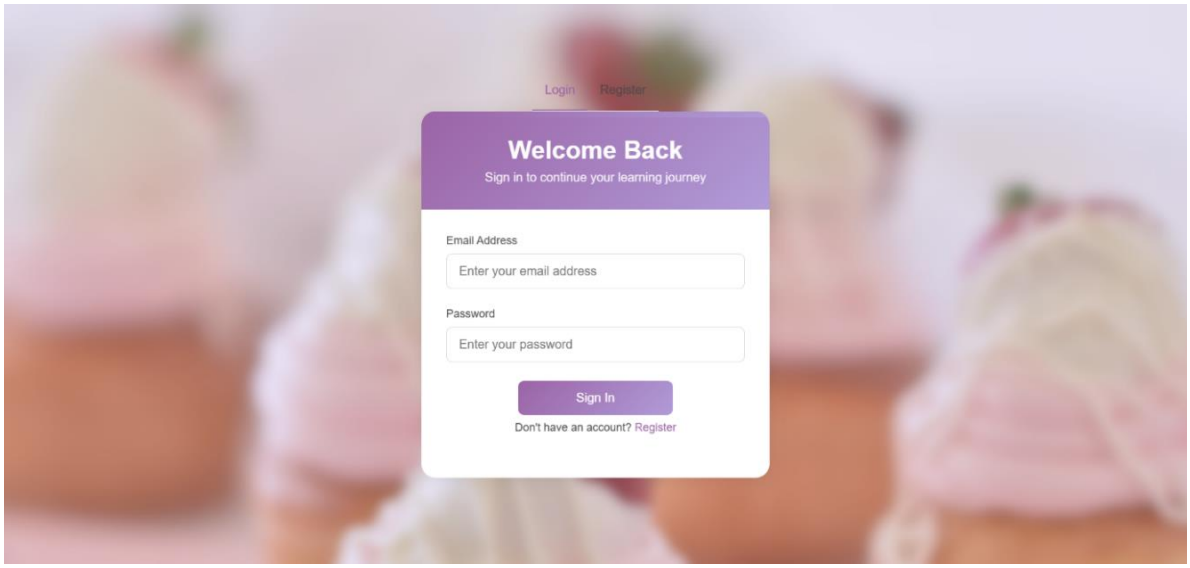

Figure 4.5.3 Login Page

Login interface for students and admins. Role-based redirection directs users to their respective dashboards upon successful authentication.

Student Dashboard

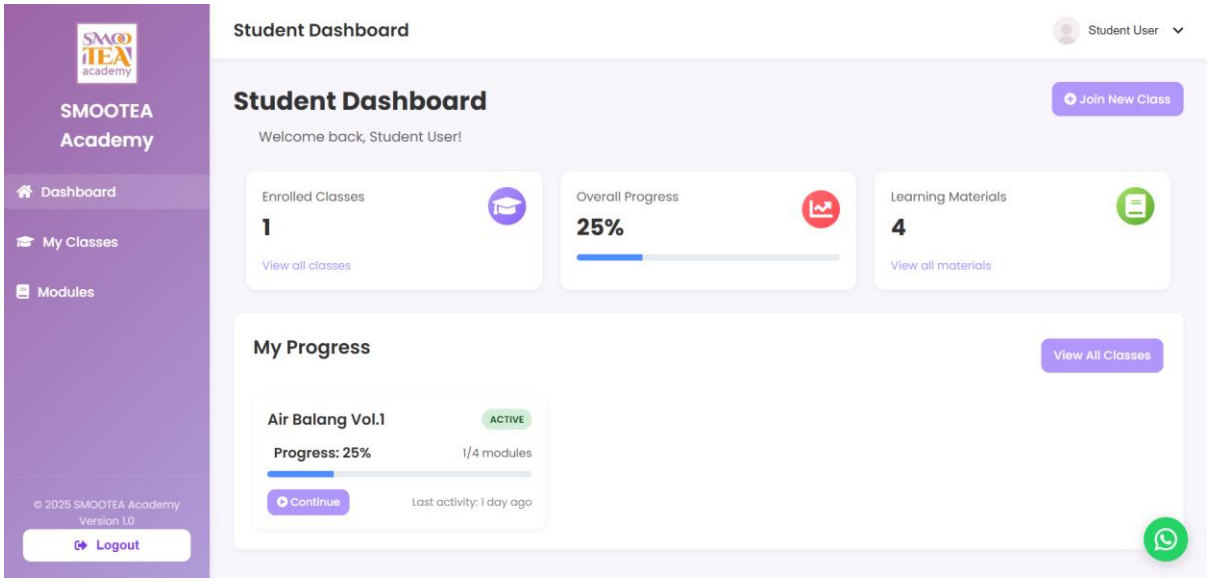

Figure 4.5.4 Student Dashboard

Personalized dashboard for students, displaying active classes, recent activity, and progress metrics. Includes quick access to learning resources and support

View My Class Page

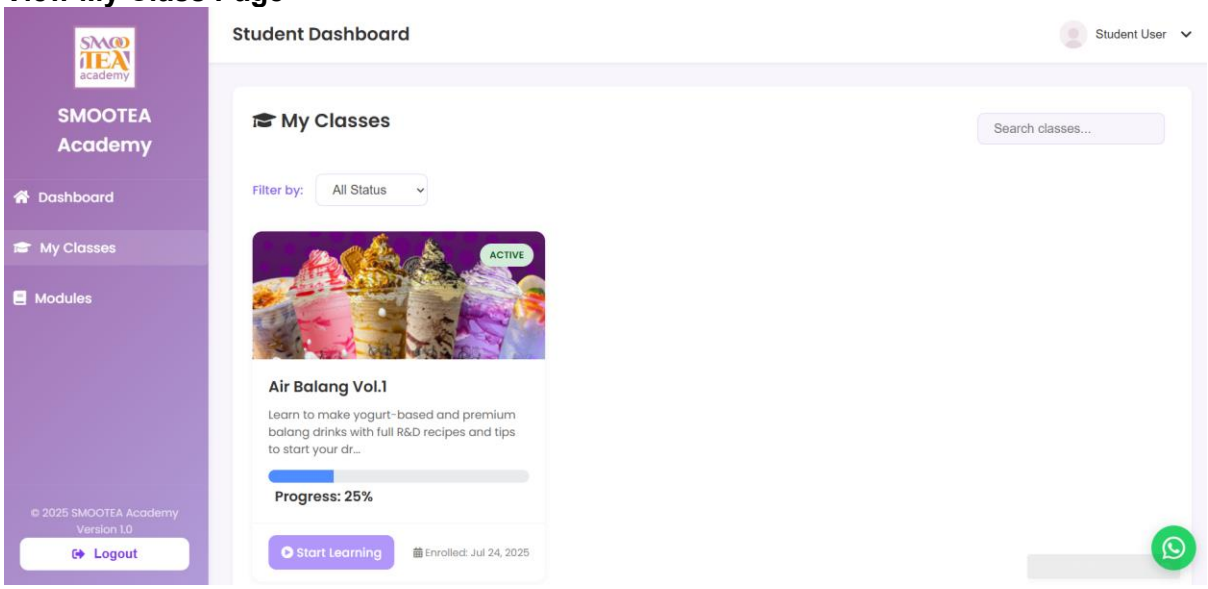

Figure 4.5.5 View My Classes Page

List of enrolled classes with titles, instructors, and access buttons. Students can navigate to specific class materials from this centralized view

Module Page

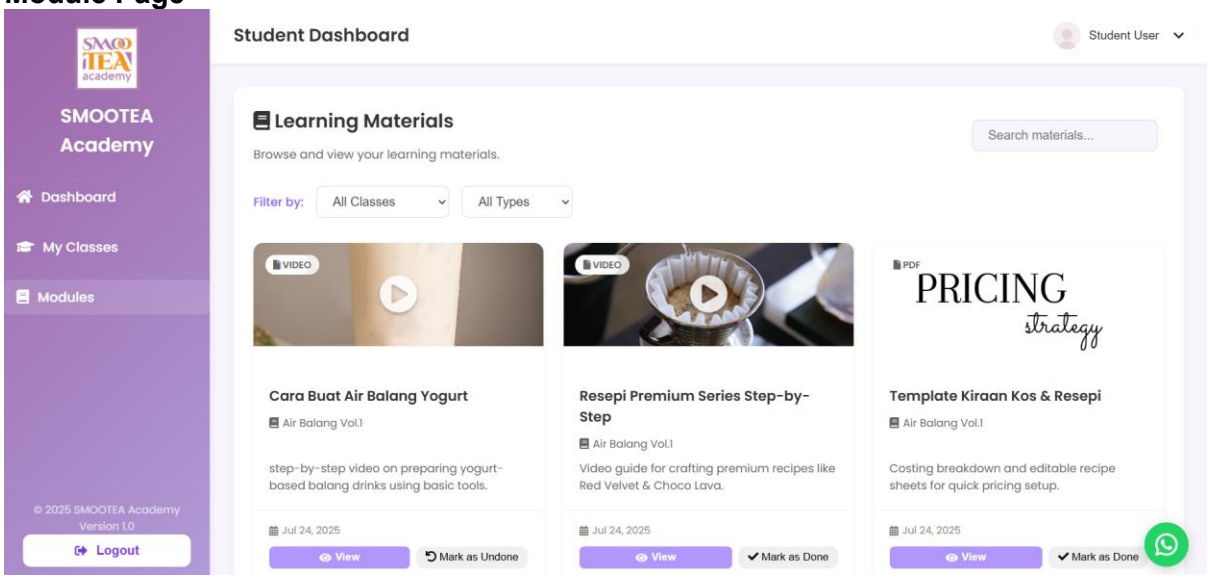

Figure 4.5.7 Module Page

Class materials hub, featuring downloadable/streamable content (PDFs, videos, links). Organized by module for structured learning.

Admin Dashboard

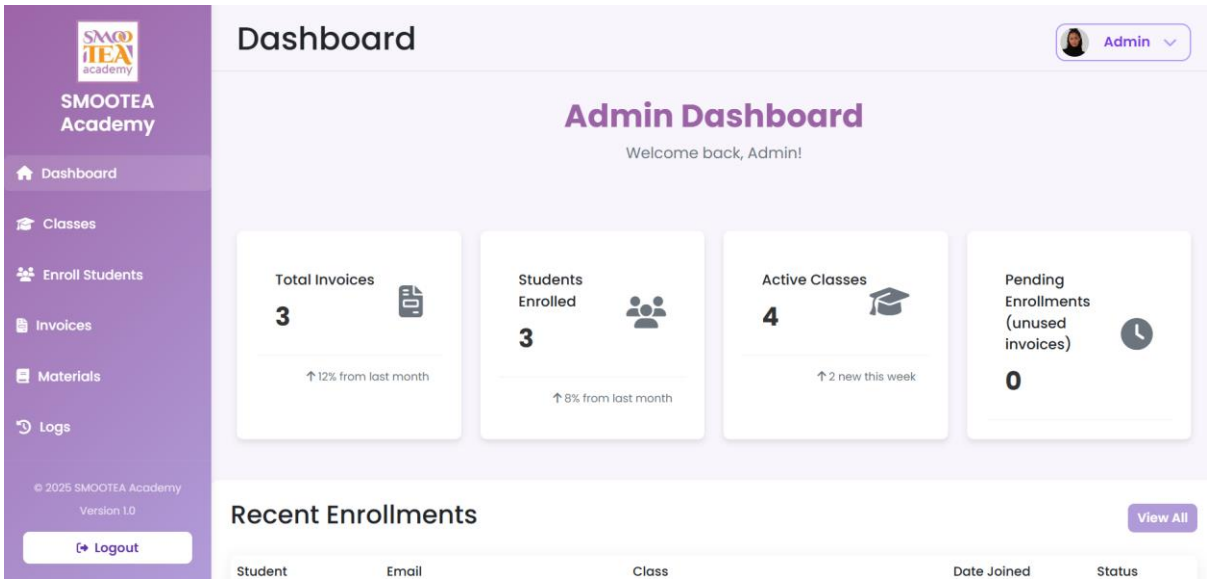

Figure 4.5.8 Admin Dashboard Page

Admin overview panel showing system metrics (total classes, students, invoices). Provides quick access to management tools and recent activity logs.

Manage Classes

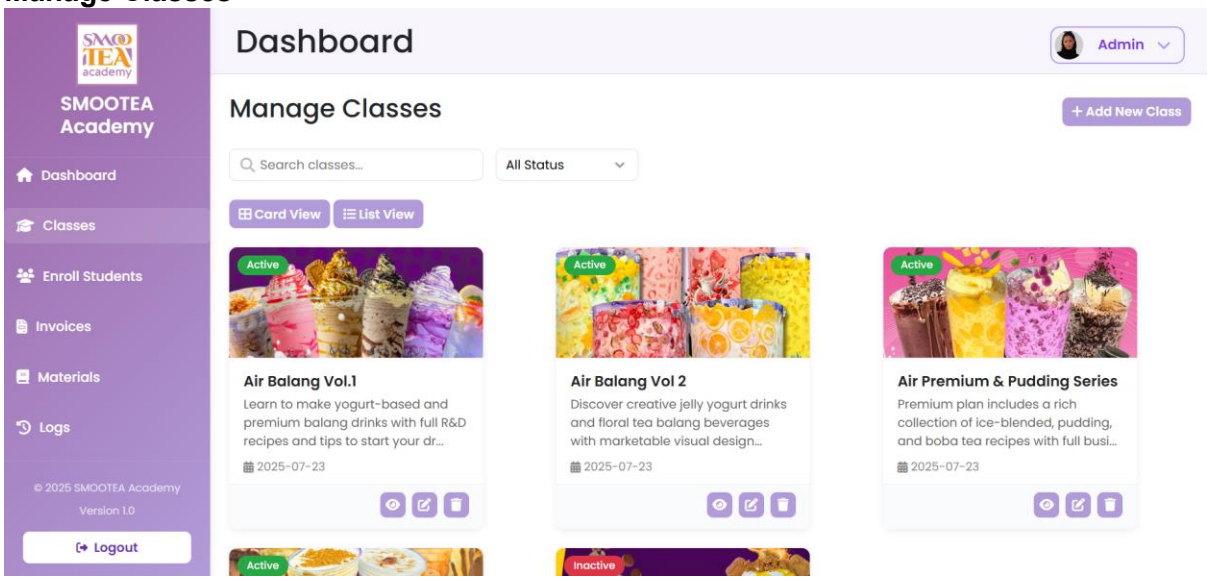

Figure 4.5.9 Admin Manage Classes

Class management interface for admins. Supports CRUD operations (Create, Read, Update, Delete) for class records, including titles and status assignments.

Admin Manage Classes – Add new Class

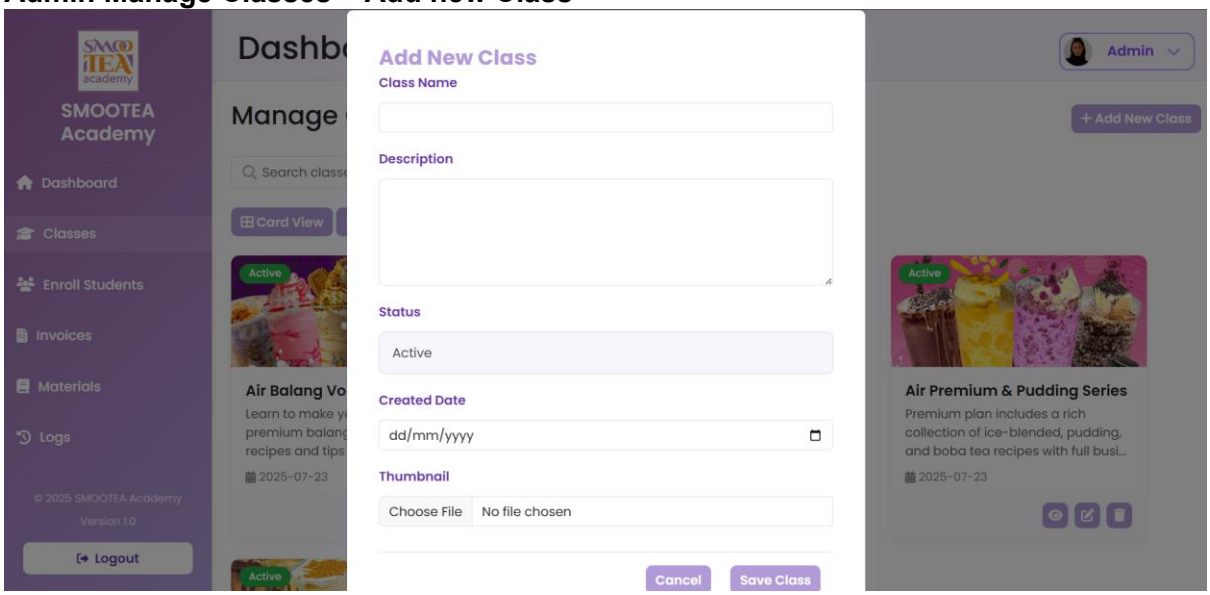

Figure 4.5.10 Admin Add New Class

Form to add new classes. Mandatory fields include title, description, and instructor. Ensures data consistency for future enrollments.

Admin Manage Classes – Edit Class

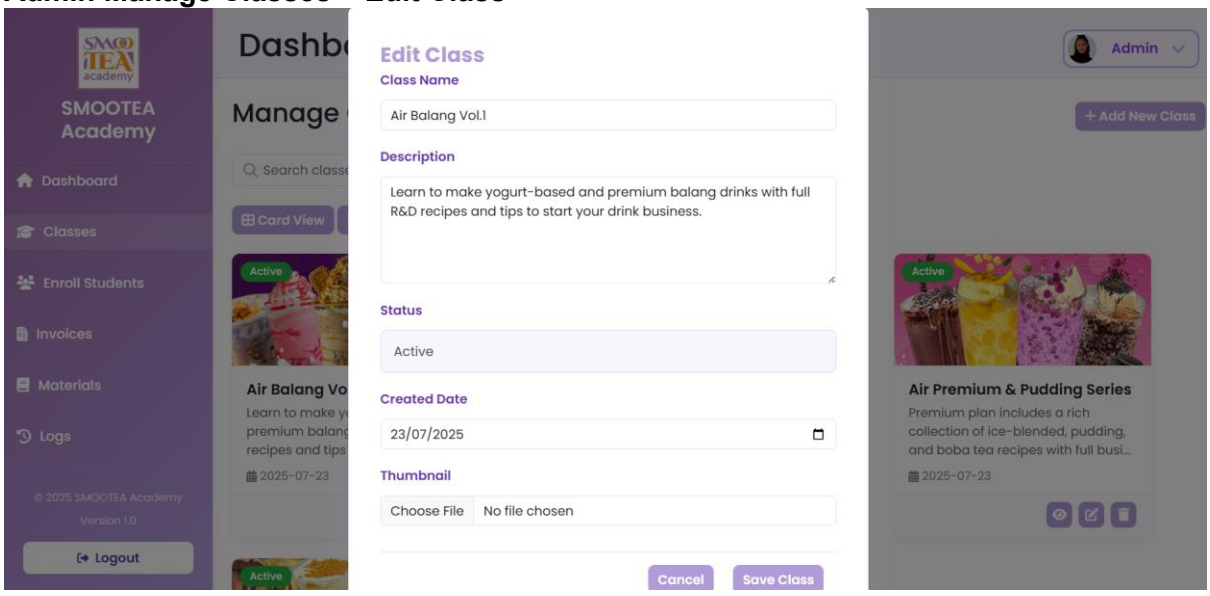

Figure 4.5.11 Admin Edit Classes

Class editing interface. Admins modify existing class details (e.g., title, description, status and thumbnail) with real-time database updates.

Admin Manage Classes – Delete Class

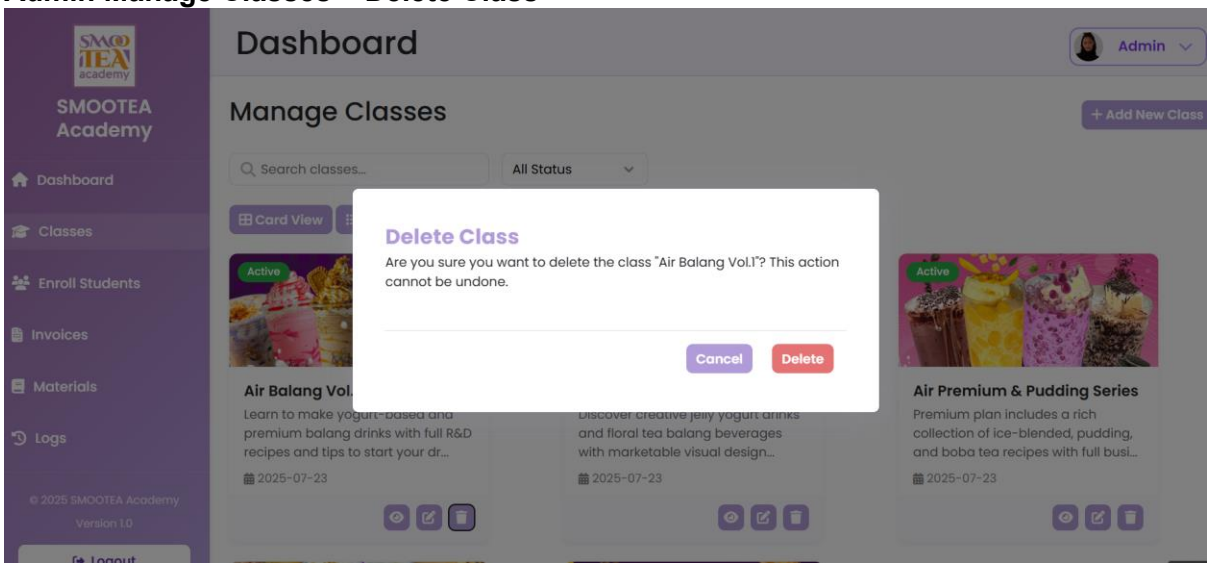

Figure 4.5.12 Admin Delete Classes

Confirmation dialog for class deletion. Prevents accidental data loss with a verification step.

Manage Class Materials

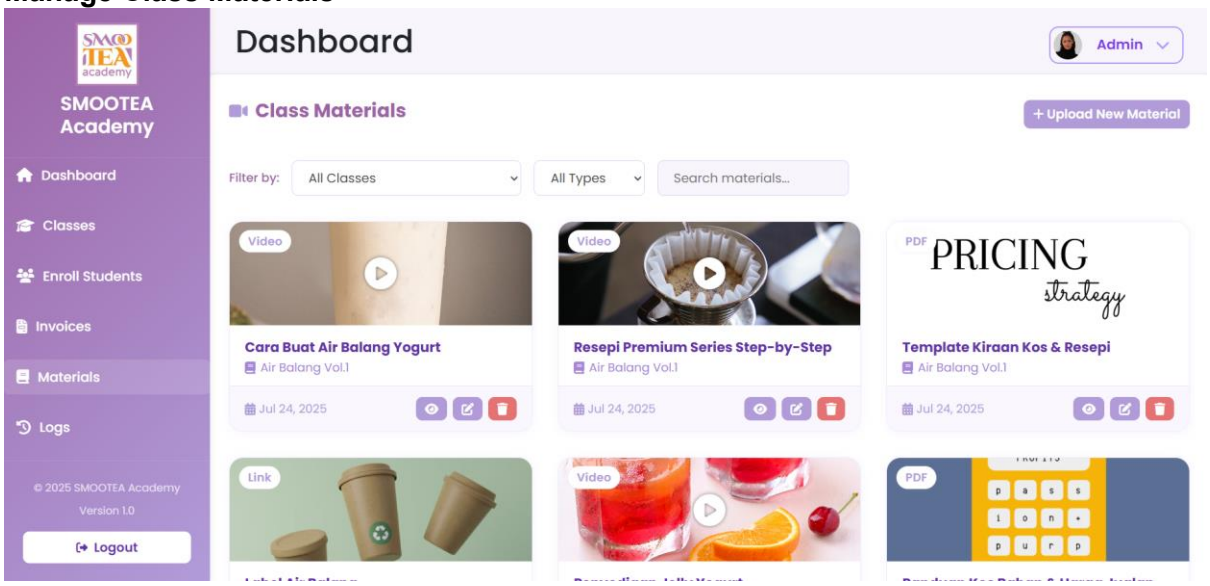

Figure 4.5.13 Admin Manage Class Materials

Material management panel. Admins upload, tag and organize resources (PDFs, videos) by class, with filtering options for efficiency.

Manage Class Materials – Upload New Material

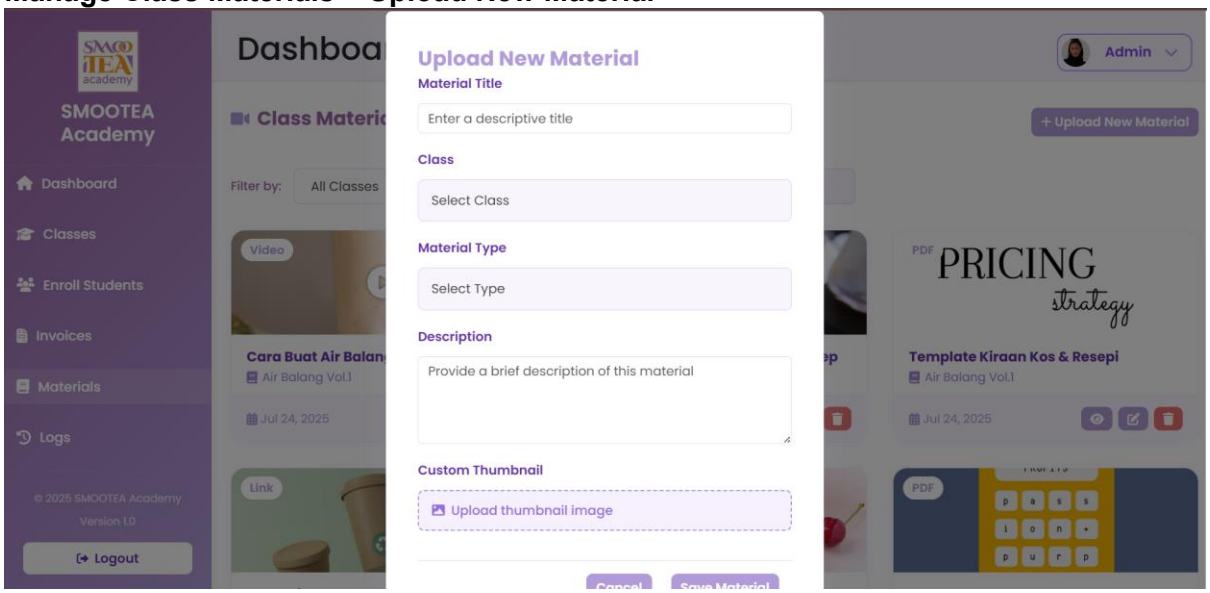

Figure 4.5.14 Admin Upload New Material

Form for uploading new learning materials. Supports files (PDF, video) or external links, with fields for title, type, and description.

Manage Class Materials – View Material

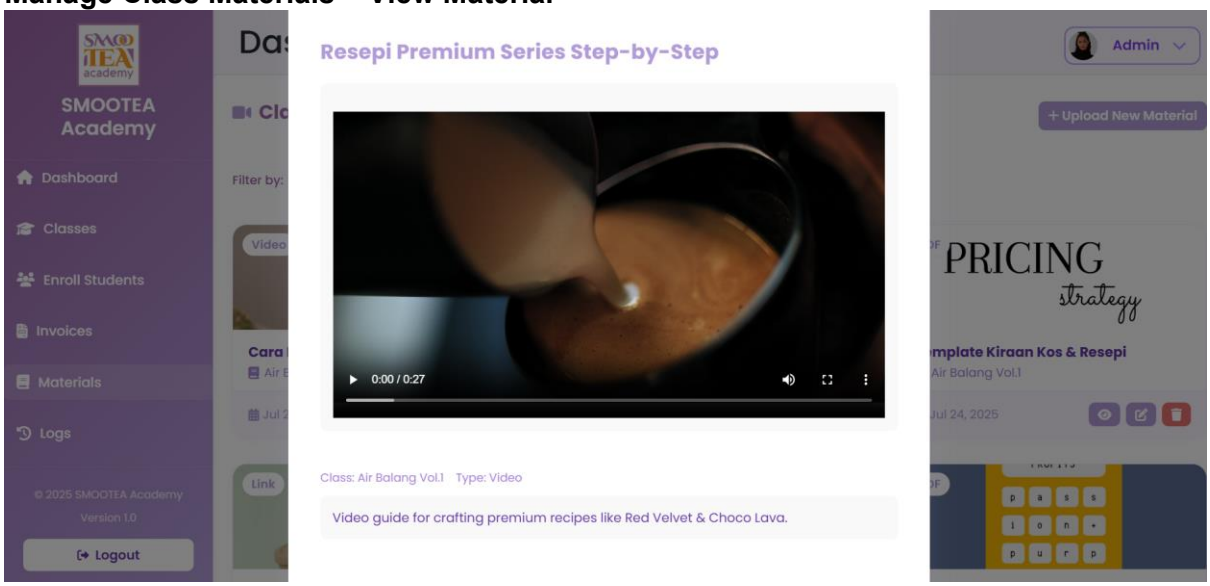

Figure 4.5.15 Admin View Material

Preview mode for uploaded materials. Admins verify content accuracy before publishing to students.

Manage Class Materials – Edit Material

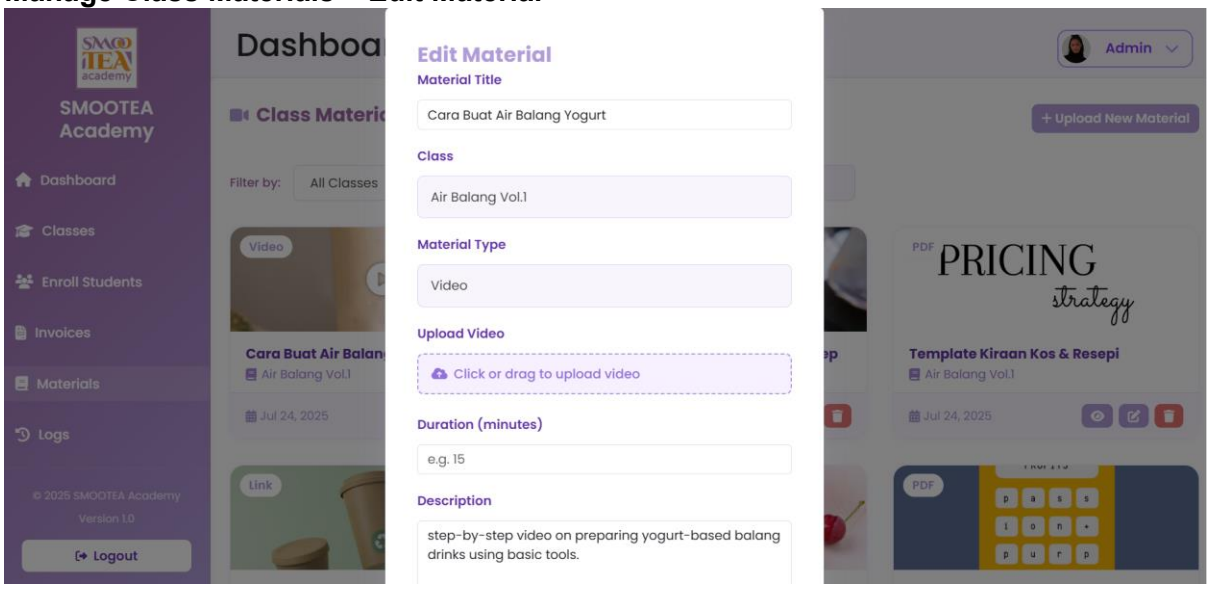

Figure 4.5.16 Admin Edit Material

Edit interface for existing materials. Admins update metadata (title, description) or replace files as needed.

Manage Class Materials – Delete Material

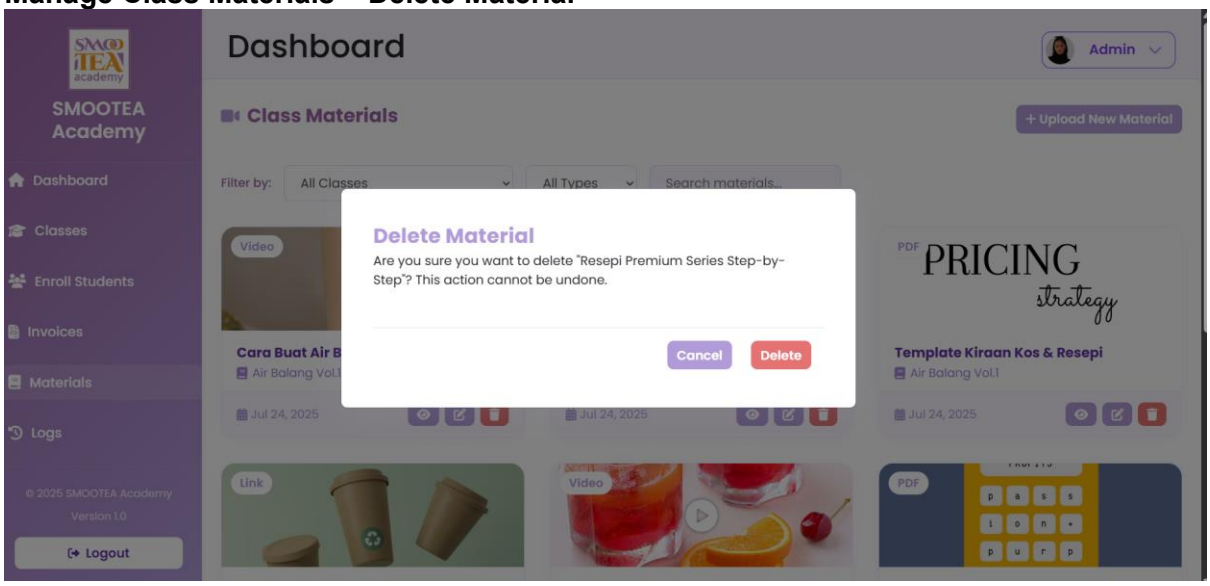

Figure 4.5.17 Admin Delete Material

Material deletion confirmation. Includes safeguards to prevent unintended removal of critical resources.

Admin Manage Invoices

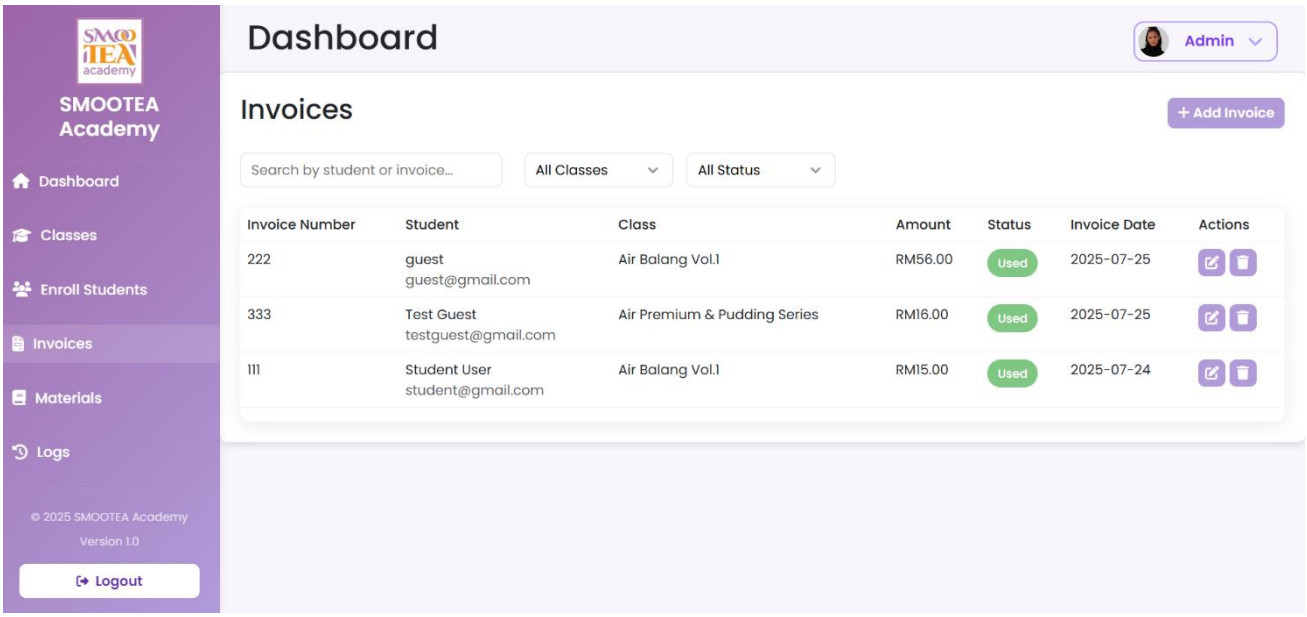

Figure 4.5.18 Admin Manage Invoices

Invoice management table. Admins add, edit or delete invoice records to validate student enrollments.

Admin View Enrolled Student

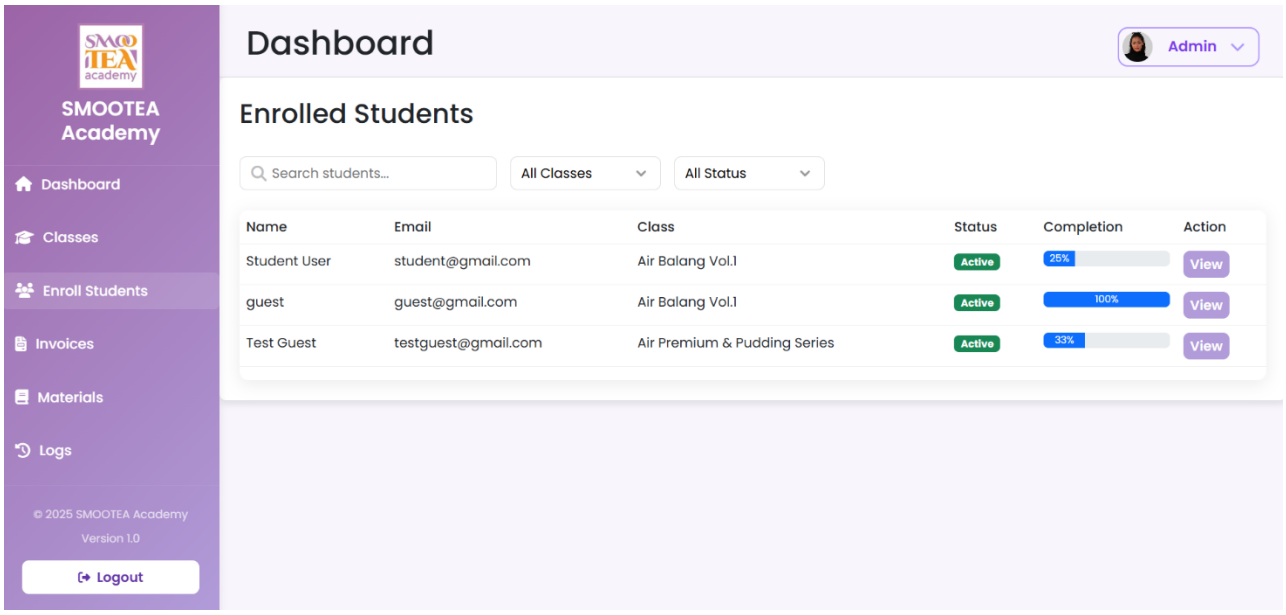

Figure 4.5.19 Admin View Enrolled Student

Enrollment oversight panel. Admins view enrolled student and their progress.

5. Other Nonfunctional Requirements

5.1. Performance Requirements

The performance requirements of the SLACES system are aimed at maintaining data integrity, consistency, and quick accessibility to all users. This is to have the system database which is driven by MySQL and controlled by Laravel and Laragon to be optimized to support multiple class enrollments, uploading of materials and tracking progress with minimal latency. The synchronization should be in real-time that the availability of classes and enrollment statuses remain up to date, particularly when there are high registration times. Tough validation procedures and checks should be established to detect and correct any anomalies in enrollment data, invoice codes, or material records as soon as possible. The system must be able to make sure that any changes, including new enrollments or uploads of material, are instantly reflected in all the interfaces and dashboards. Performance monitoring tools are to be implemented to measure the response time of servers and efficiency of database queries and the overall throughput of systems, ensuring responsiveness and reliability with increased user numbers.

5.2. Safety Requirements

In order to sustain the safety and reliability of SLACES, the system should lack any malicious or unsafe software components. It is necessary to conduct regular security audits, code reviews and use trusted anti-malware solutions to keep the system integrity. The platform architecture should have protection against unauthorized access, data tampering, or deliberate compromise, with secure authentication protocols and encrypted communication protocols. Any input made by the user, including registration information, invoice codes, and uploaded content, should be subject to rigorous validation to guard against injection attacks and invalid data entry. It is required to comply with industry best practices of web application security (e.g., OWASP) and other organizational policies. The system should reject any effort to enter wrong enrollment dates or view restricted materials and there should be strong data protection procedures to avoid corruption or loss of data even when the server or applications fail.

5.3. Security Requirements

In order to provide a strong security to the SLACES system, sophisticated data protection and user authentication measures should be provided. All sensitive user data (registration data, invoice codes, and learning contents) should be encrypted in transit (HTTPS/SSL) and at rest. The system will be highly guarded and only the relevant administrators and students will be allowed to access the system with unique usernames and strong passwords. All privileged accounts should be subjected to multi-factor authentication (MFA) to further protect against unauthorized access. Any

important tasks including class enrollments and uploads of materials should be timestamped and identifiable by the user so as to allow traceability and accountability. It is necessary to adhere to external security standards and any relevant privacy regulations (e.g., GDPR or local data protection laws) and where necessary, the system must gain appropriate certifications. The administrative functions should be limited to authorized users by means of role-based access controls, and security audits should be conducted on a regular basis to evaluate and mitigate vulnerabilities. All these measures safeguard the integrity, confidentiality and availability of the system hence reducing chances of data breaches or unauthorized usage.

5.4. Software Quality Attributes

Adaptability:

The SLACES system should be able to support the changes in the business rules easily, including adding new enrollment triggers, or updating the class status workflow, without refactoring a lot of code. Change requests should be able to be handled within one development cycle at least 90 percent of the time. Flexibility is tested regularly through business change simulations and implementation effort and time.

Usability:

The interface should be user-friendly and effective so that administrators and students can work with a minimum amount of training and the possibility of making errors. Enrollment and progress tracking features should include date pickers that do not allow invalid entries to improve the accuracy of the operation and the user experience. The aim is to cut down on the time taken to onboard new users by at least 20 percent. Regular usability testing with representative users will be carried out to find and fix any possible problems with the interface.

Maintainability:

The SLACES codebase must follow the coding standards and must be well documented in order to make it easier to maintain. Key operations, including enrollment verification and content management, should be structured in modular units in order to make the updates and debugging easy. The maintainability index of the static code analysis must be at least 80. Code reviews and inspections will be conducted regularly to check compliance with the standards and the efficiency of maintenance will be monitored through error resolution time and resource consumption during updates.

6. Other Requirements

<There is no other requirements for the time being>

Appendix A: Glossary

SLACES Smootea Learning Access and Class Enrollment System

Smootea The stakeholder organization for Smootea Academy

Data Raw data, numbers, and symbols that represent information. Data in the OODS consists of stock details, request statuses, delivery information, and order history.

Hardware The physical components of a computer system, such as servers, computers, and networking devices, are required for the system to function.

Software Computer-based programs and applications.

Database A structured collection of data structured for easy access, storage, and management.

Operating System Software that holds computer hardware and provide services to computer applications.

Domain Class Diagram A visual illustration of the classes, relationships, and attributes inside the system's domain, providing an understanding of the important elements and how they relate to one another.

Use Case A description of a system's behavior as seen by an external actor (user or system).

Activity Diagram A UML diagram shows the flow of activities inside of a system or process, including actions, decision points, and transitions. It may be used to simulate the flow of stock requests and approvals through the system.

System Sequence Diagram A UML diagram depicting the interactions between actors and the system, including the flow of information sent.

Appendix B: Analysis Models

Activity Diagram

Business activity diagram

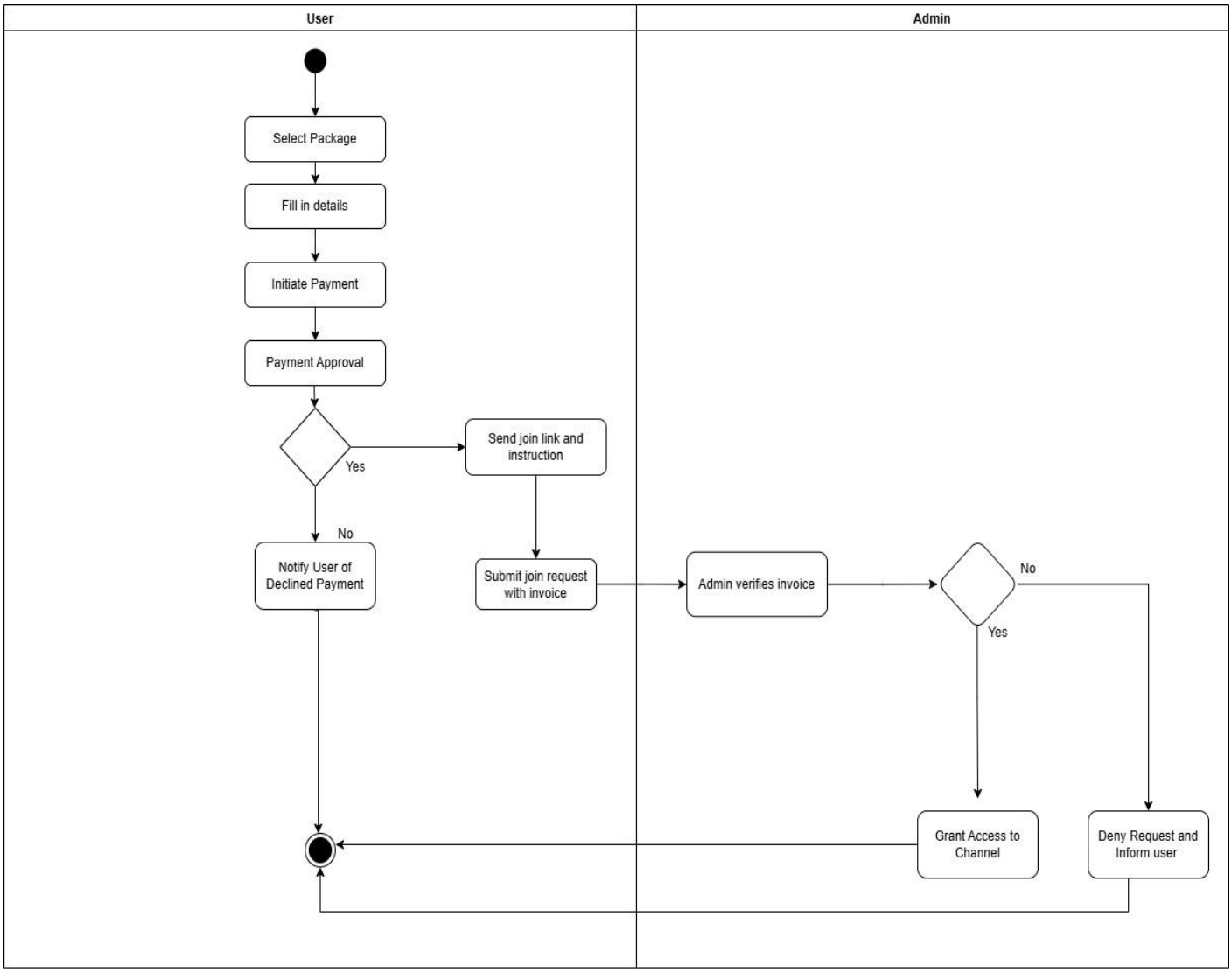

Figure B.1 Business Activity Diagram

Login

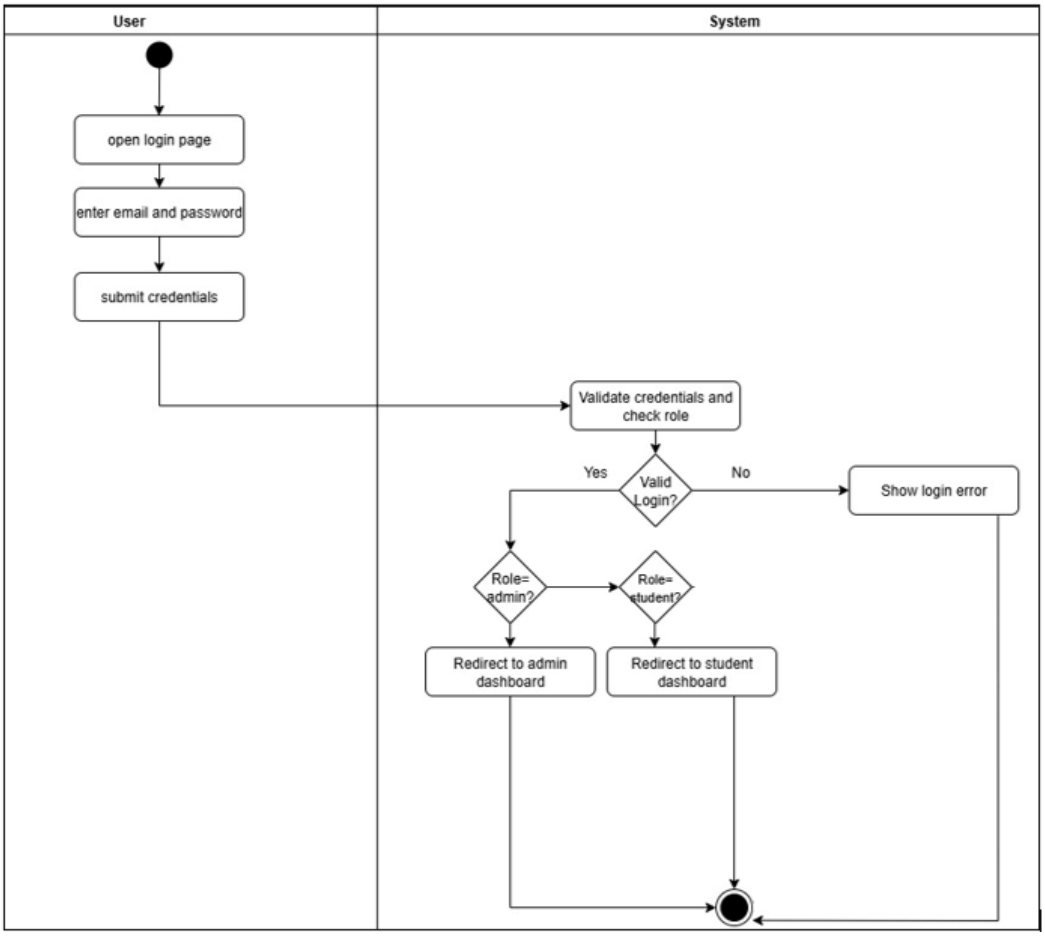

Figure B.2 Activity Diagram Login

Join New Class

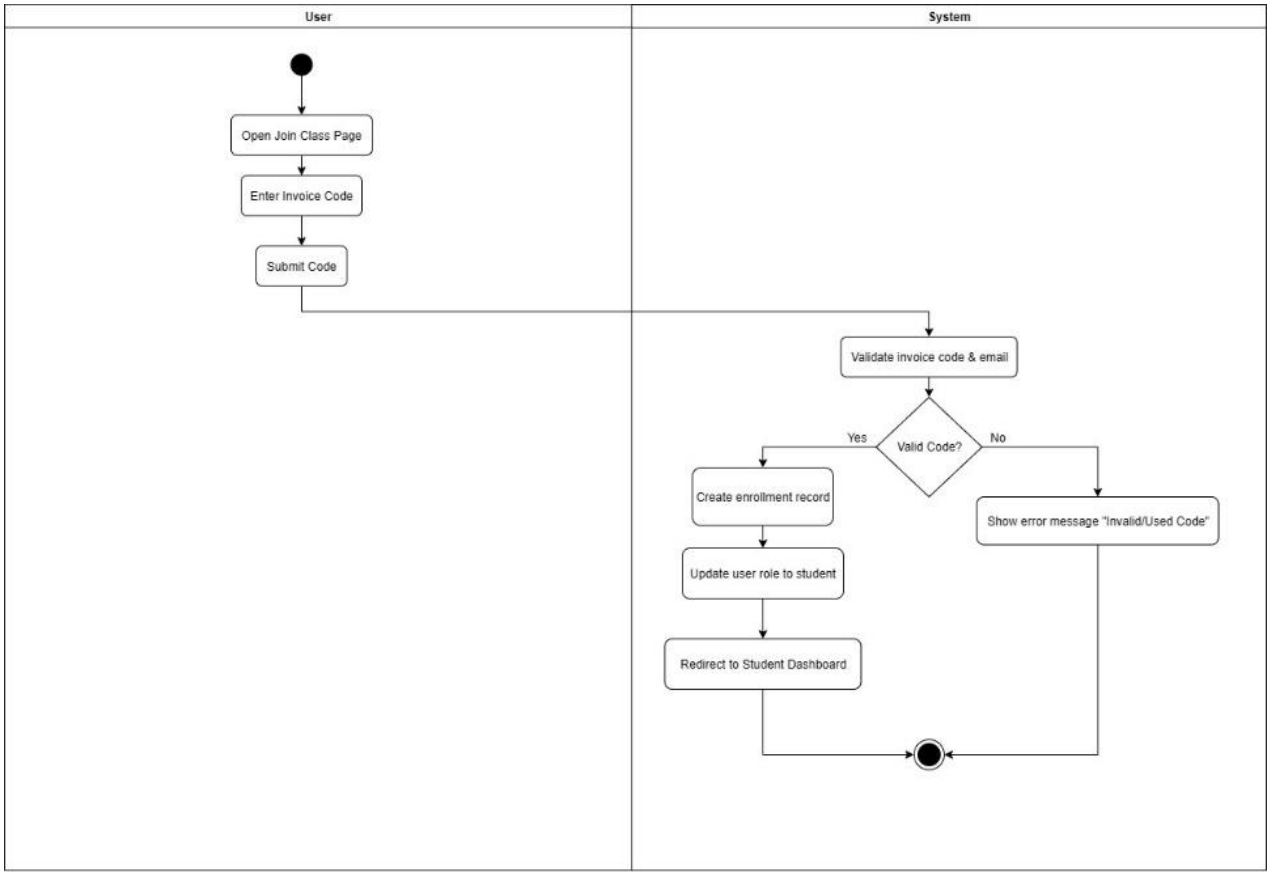

Figure B.3 Activity Diagram Join New Class

View My Classes

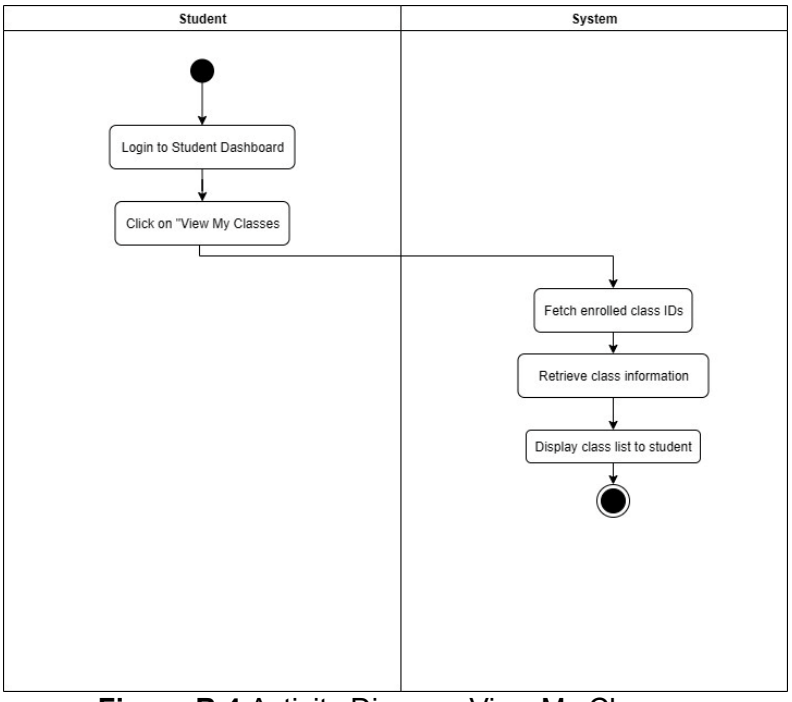

Figure B.4 Activity Diagram View My Classes

Access Class Materials

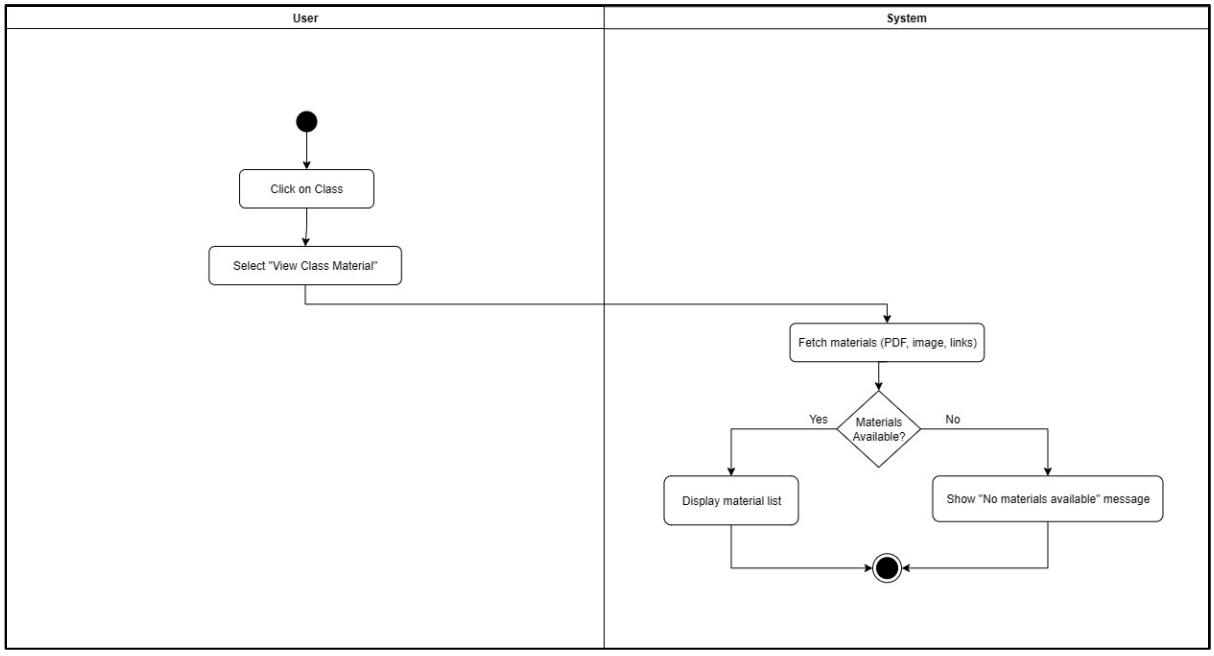

Figure B.5 Activity Diagram Access Class Materials

Contact Admin

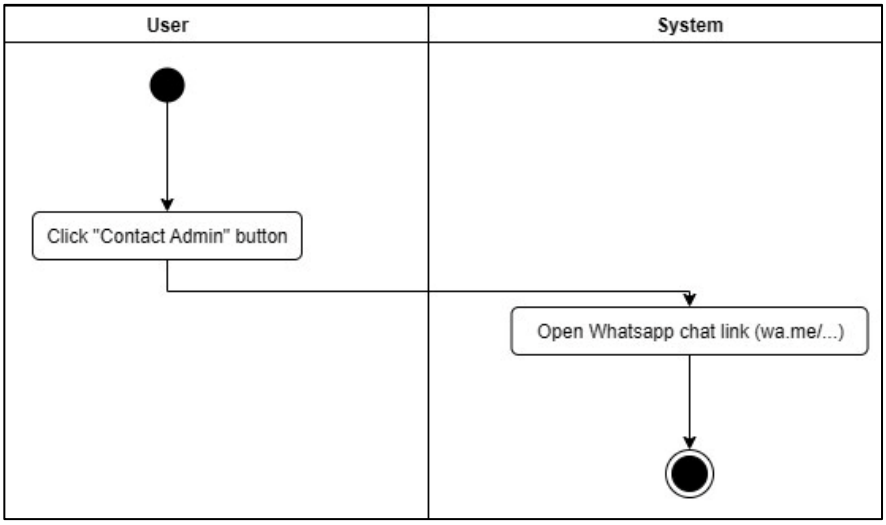

Figure B.6 Activity Diagram Access Contact Admin

Manage Classes

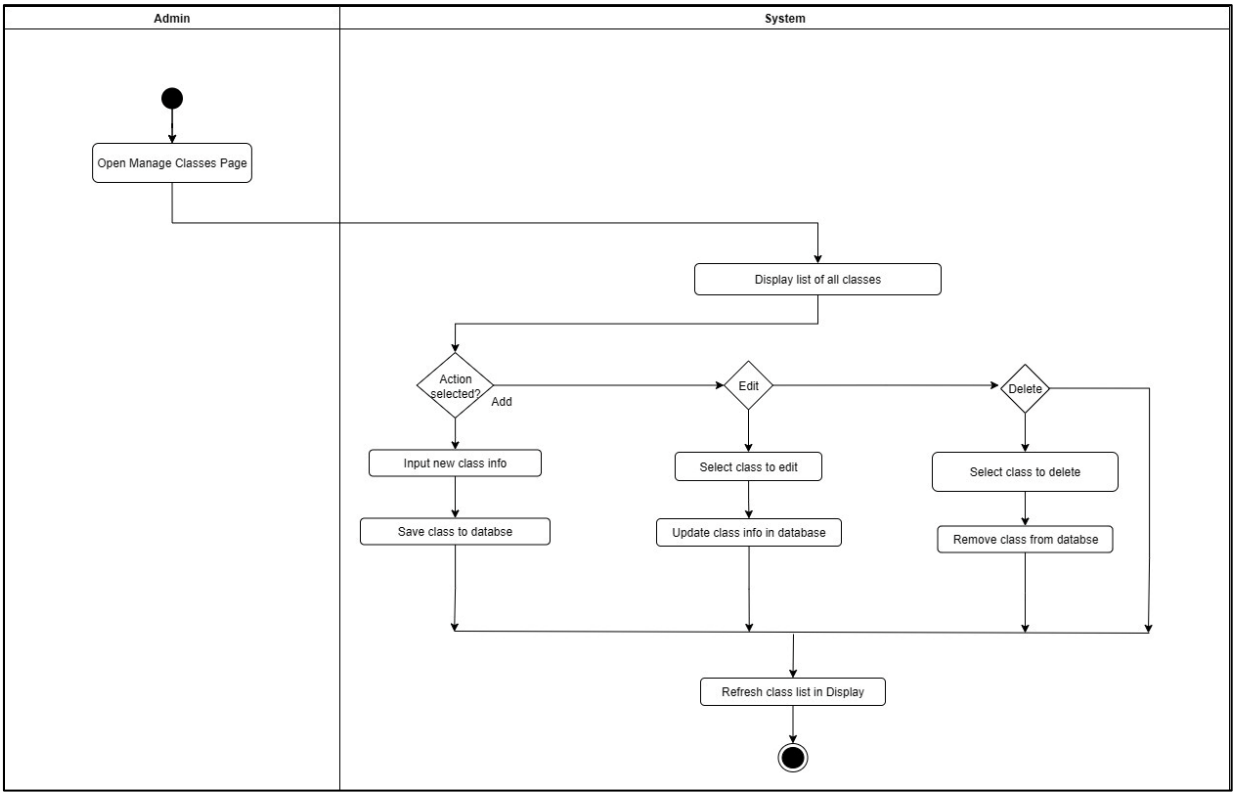

Figure B.7 Activity Diagram Manage Classes

Manage Class Materials

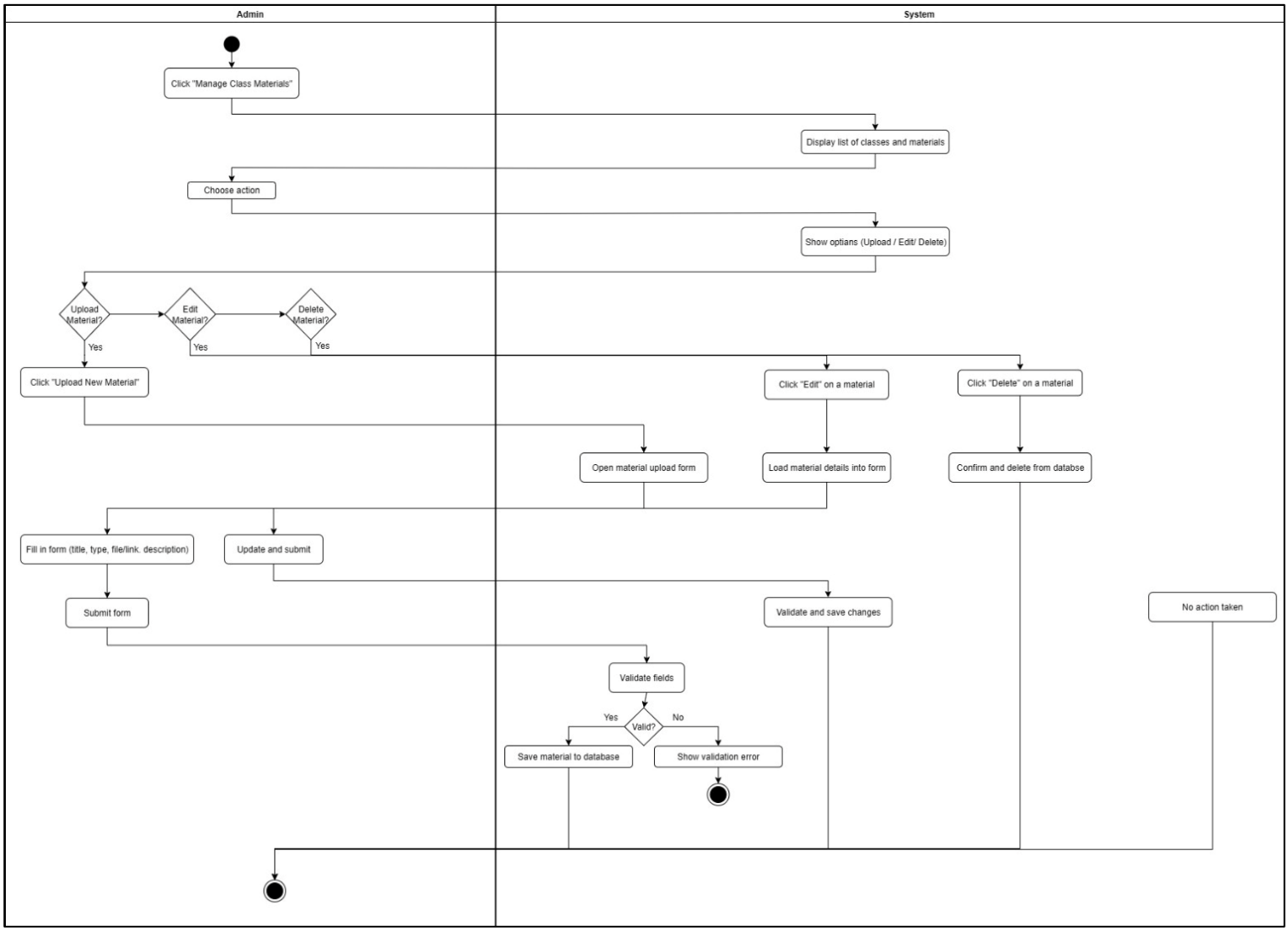

Figure B.8 Activity Diagram Manage Class Materials

Manage Invoices

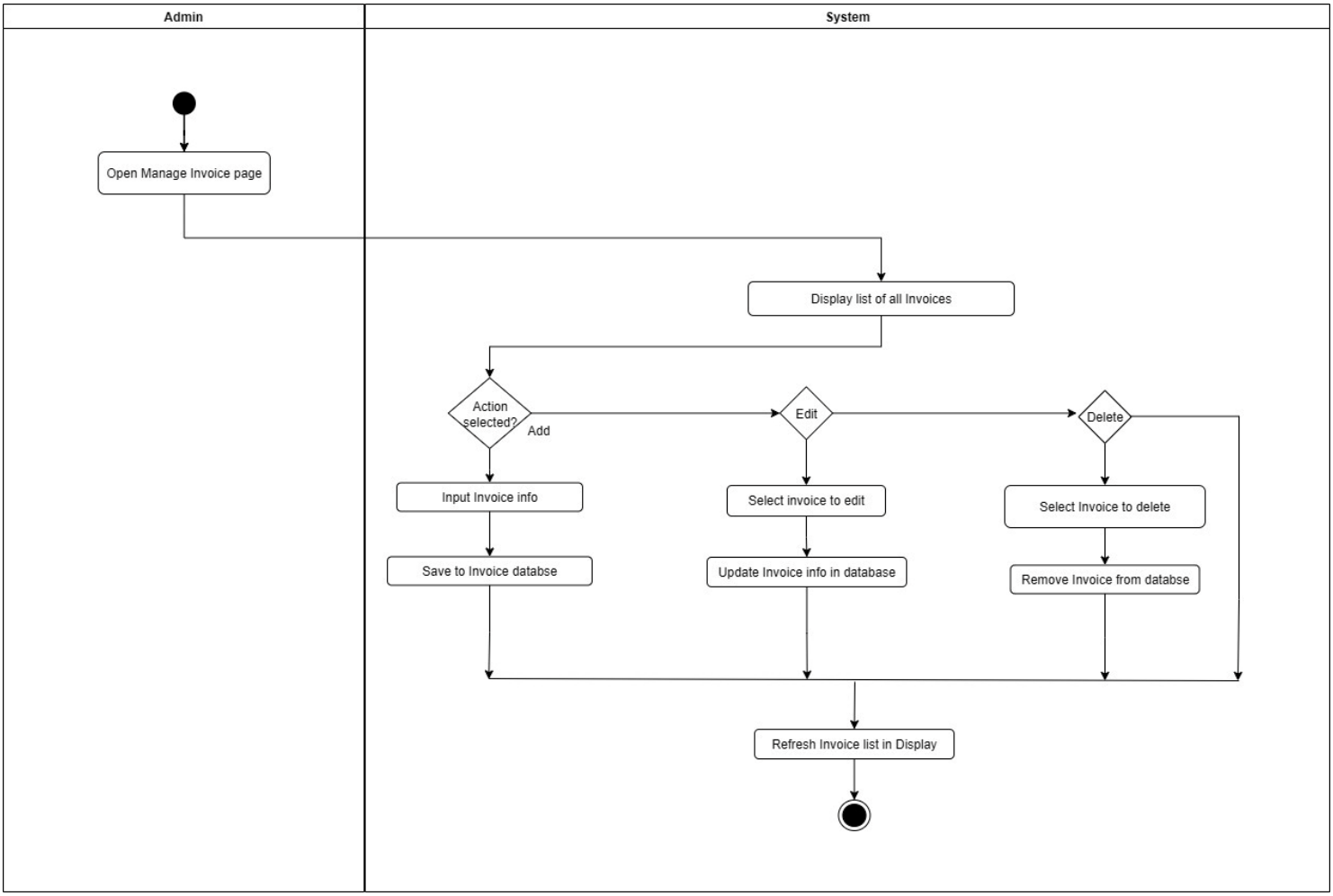

Figure B.9 Activity Diagram Manage Invoice

View Enrolled Students

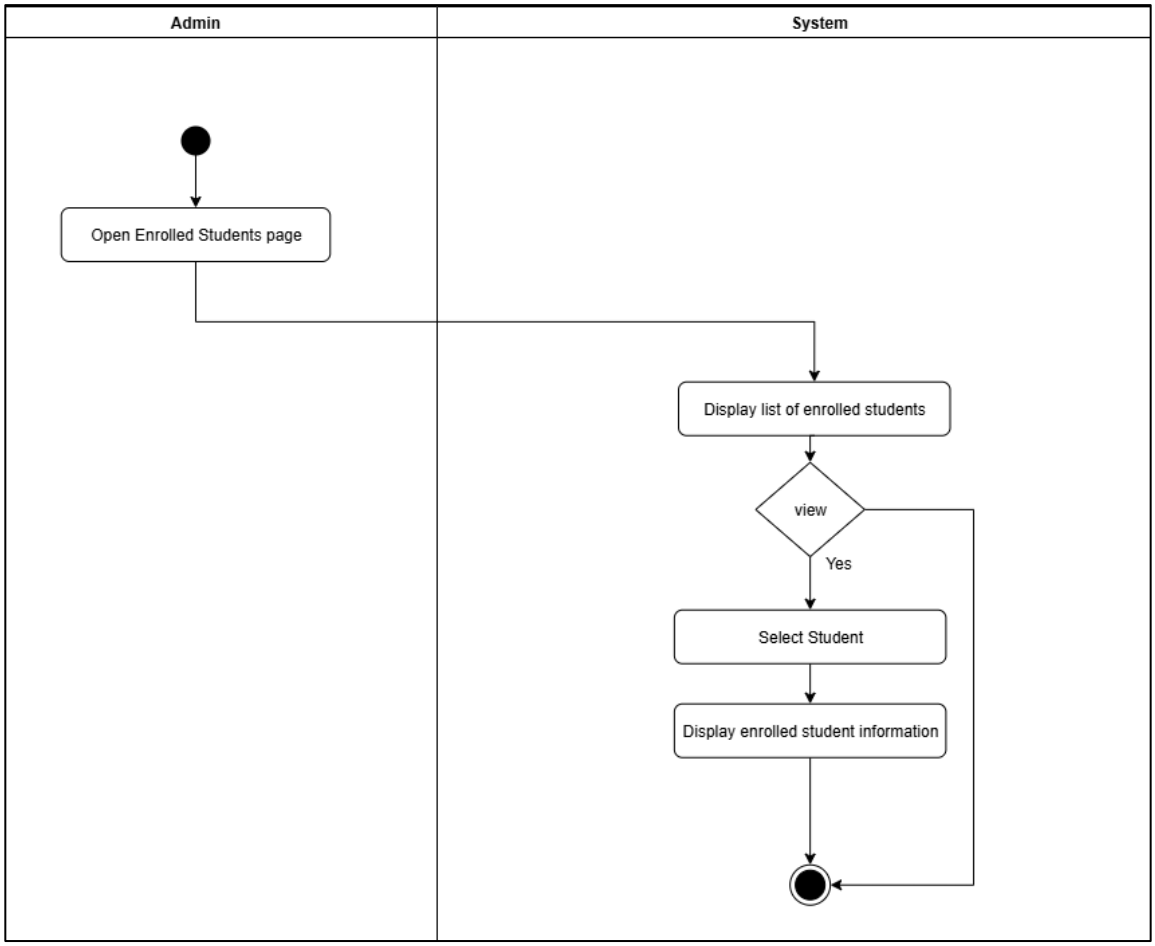

Figure B.10 Activity Diagram View Enrolled Students

Domain Class Diagram

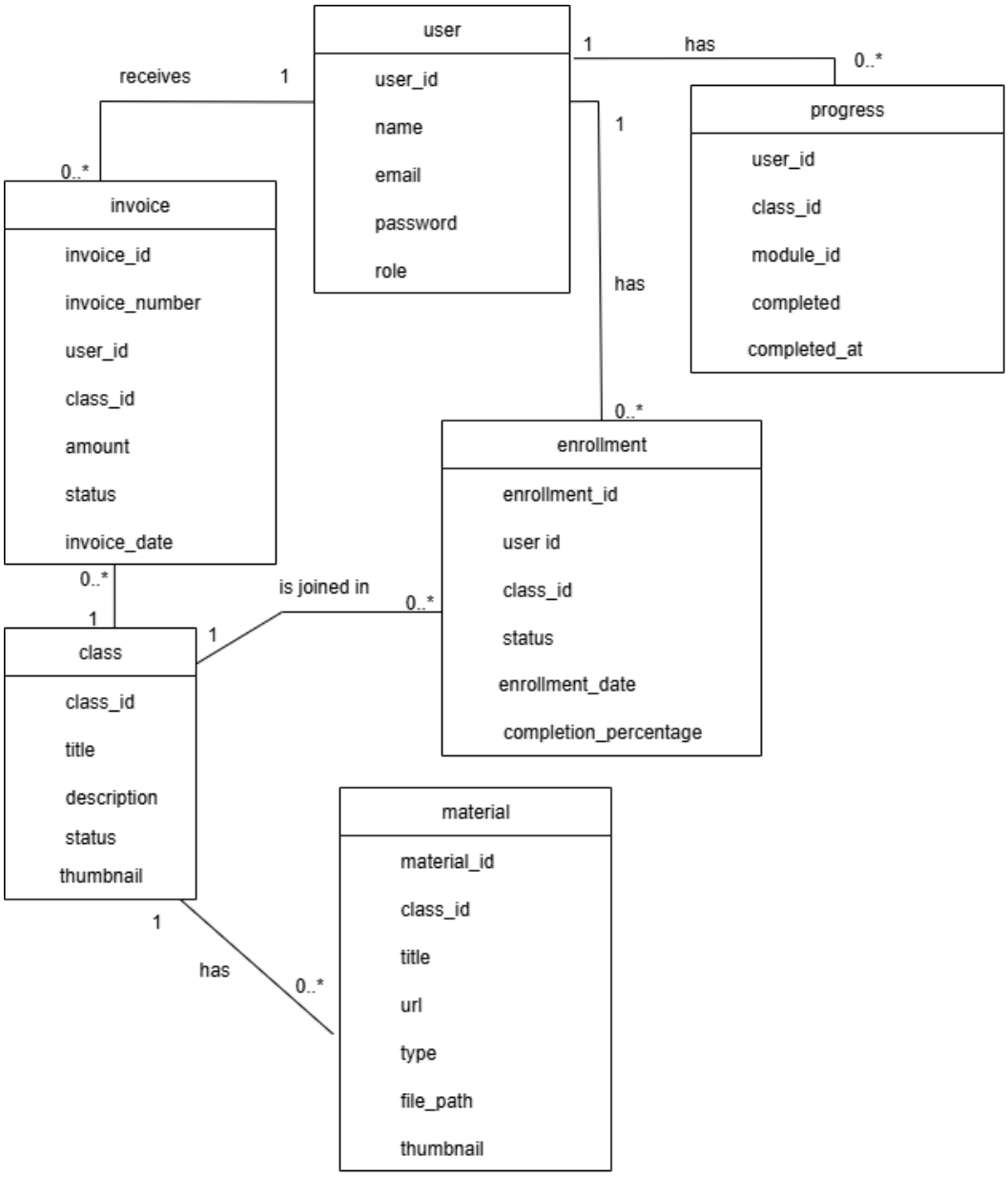

Figure B.11 Domain Class Diagram

Sequence Diagram

Login

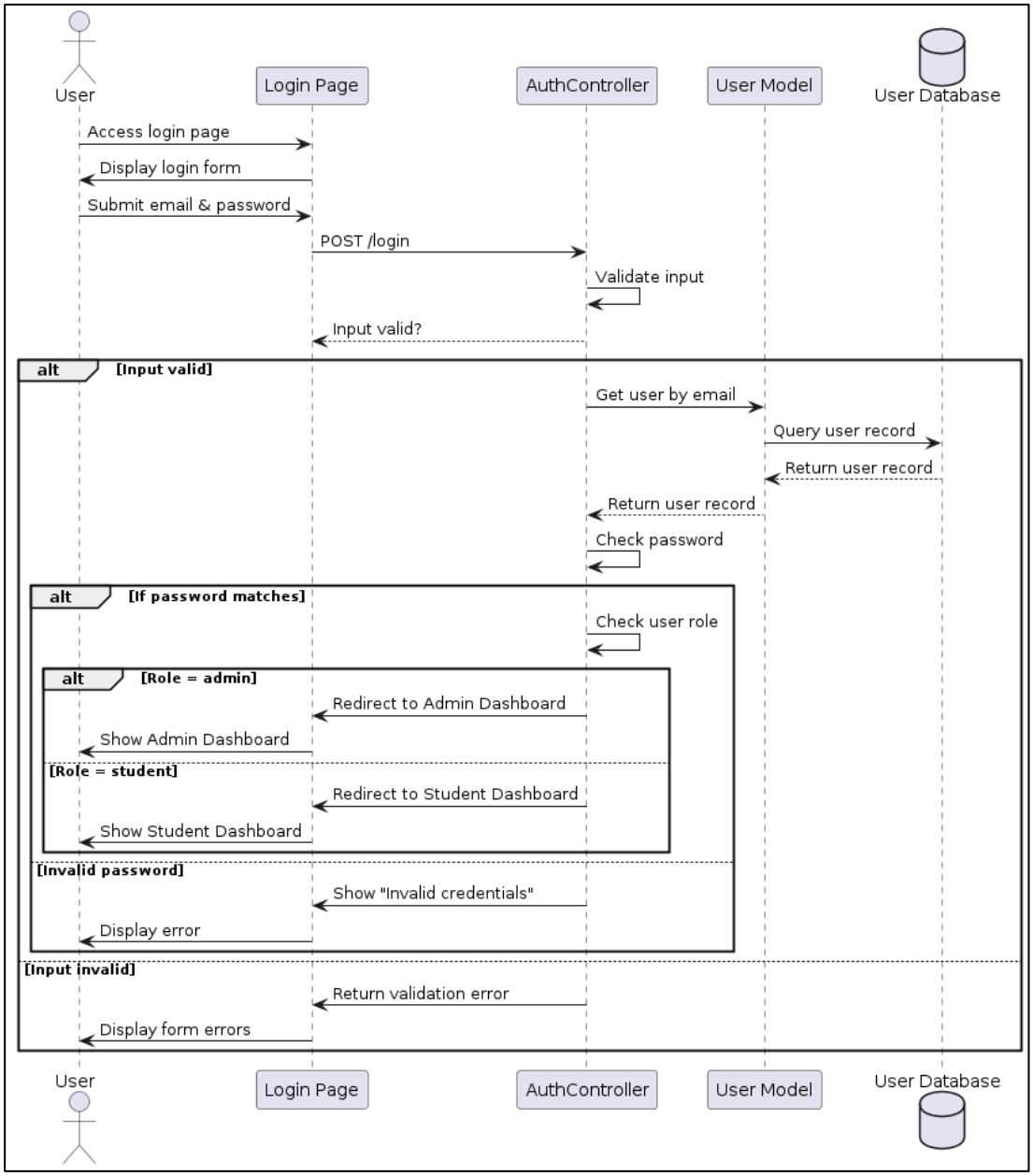

Figure B.12 Sequence Diagram Login

Join New Class

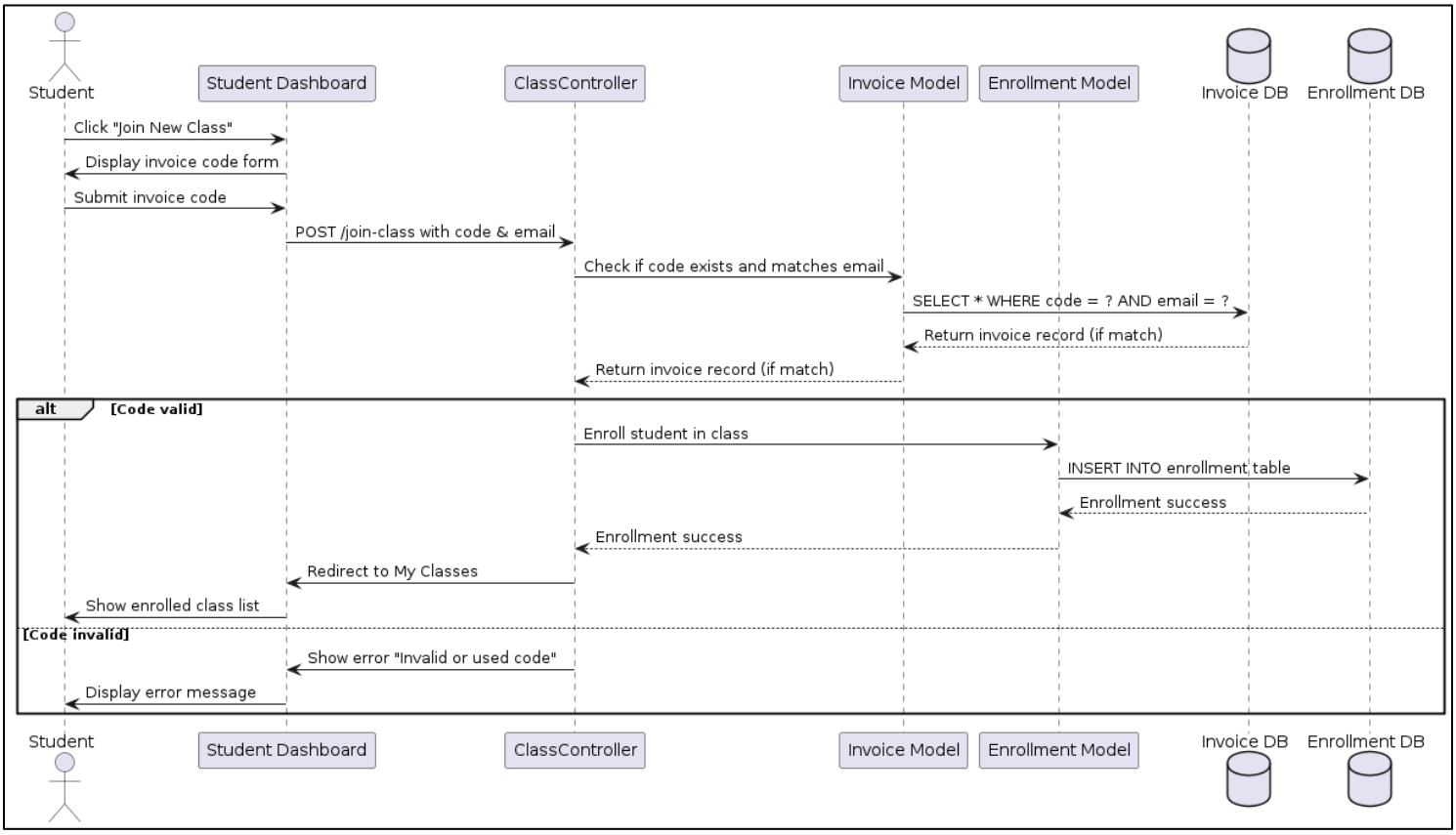

Figure B.13 Sequence Diagram Join New Class

View My Classes

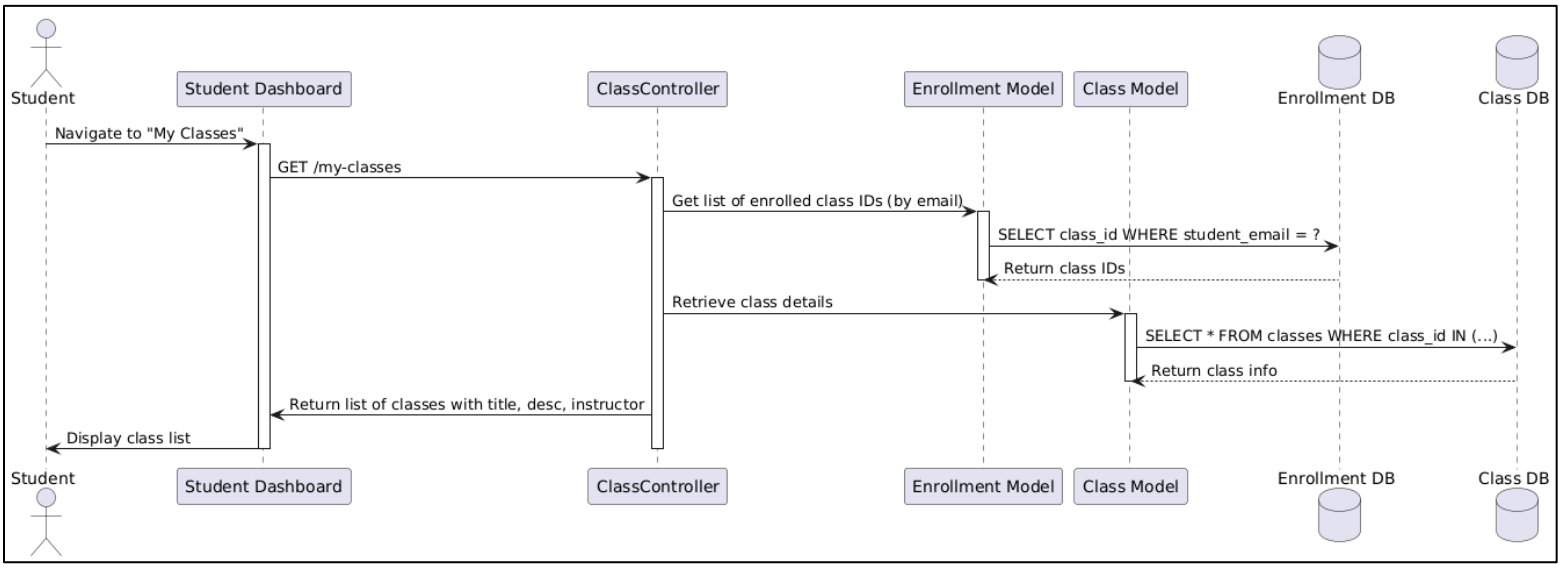

Figure B.14 Sequence Diagram View My Classes

Access Class Materials

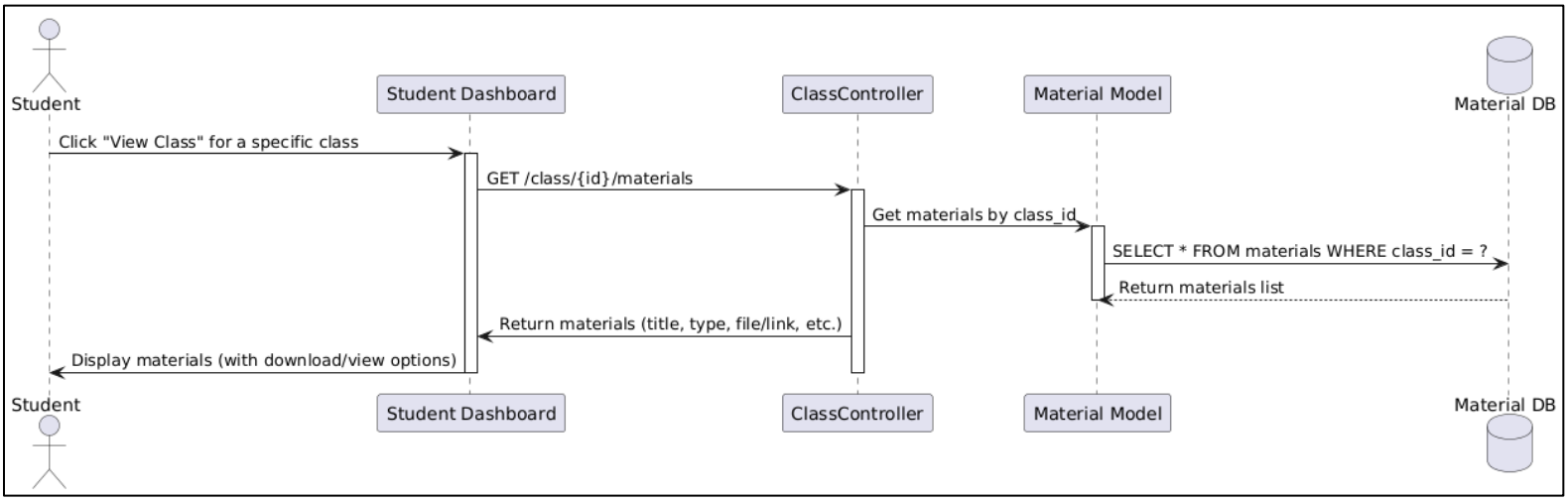

Figure B.15 Sequence Diagram Access Class Materials

Contact Admin

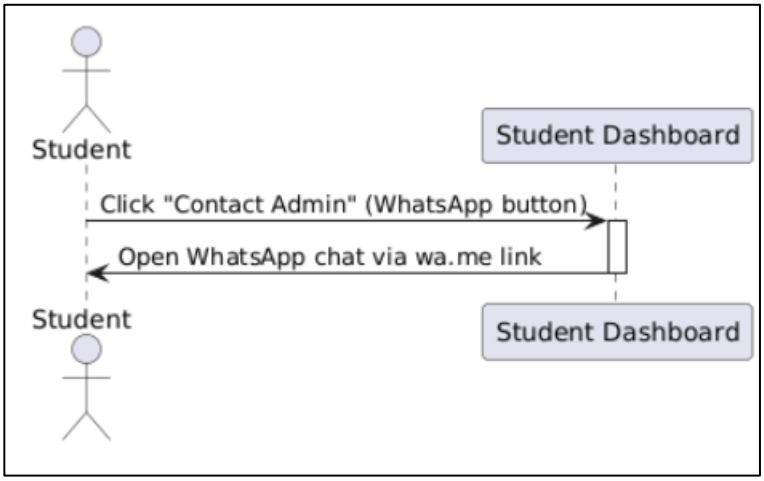

Figure B.16 Sequence Diagram Access Contact Admin

Manage Invoices

Figure B.17 Sequence Diagram Manage Invoice

Manage Classes

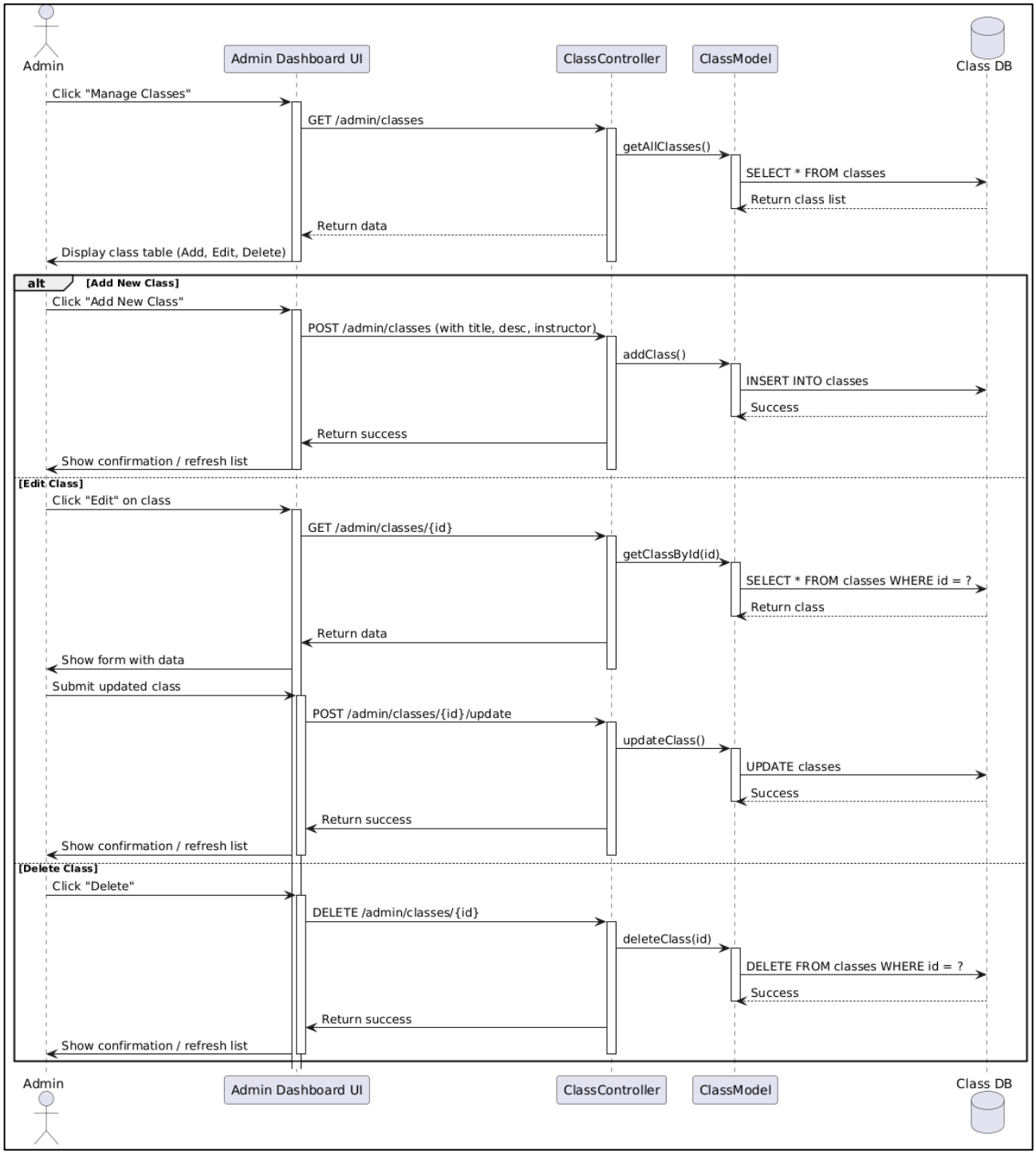

Figure B.18 Sequence Diagram Manage Classes

Manage Class Materials

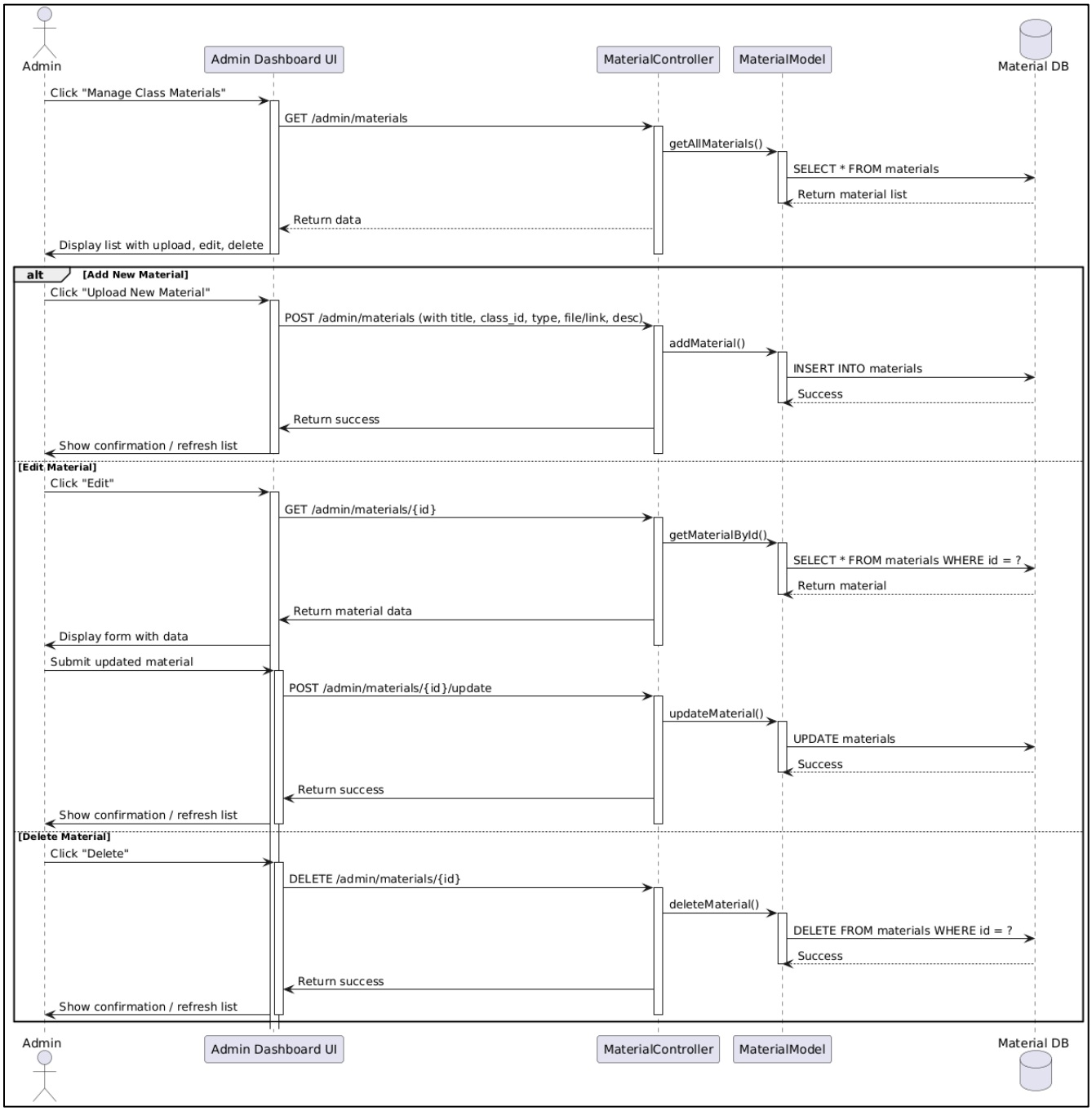

Figure B.19 Sequence Diagram Manage Class Materials

View Enrolled Students

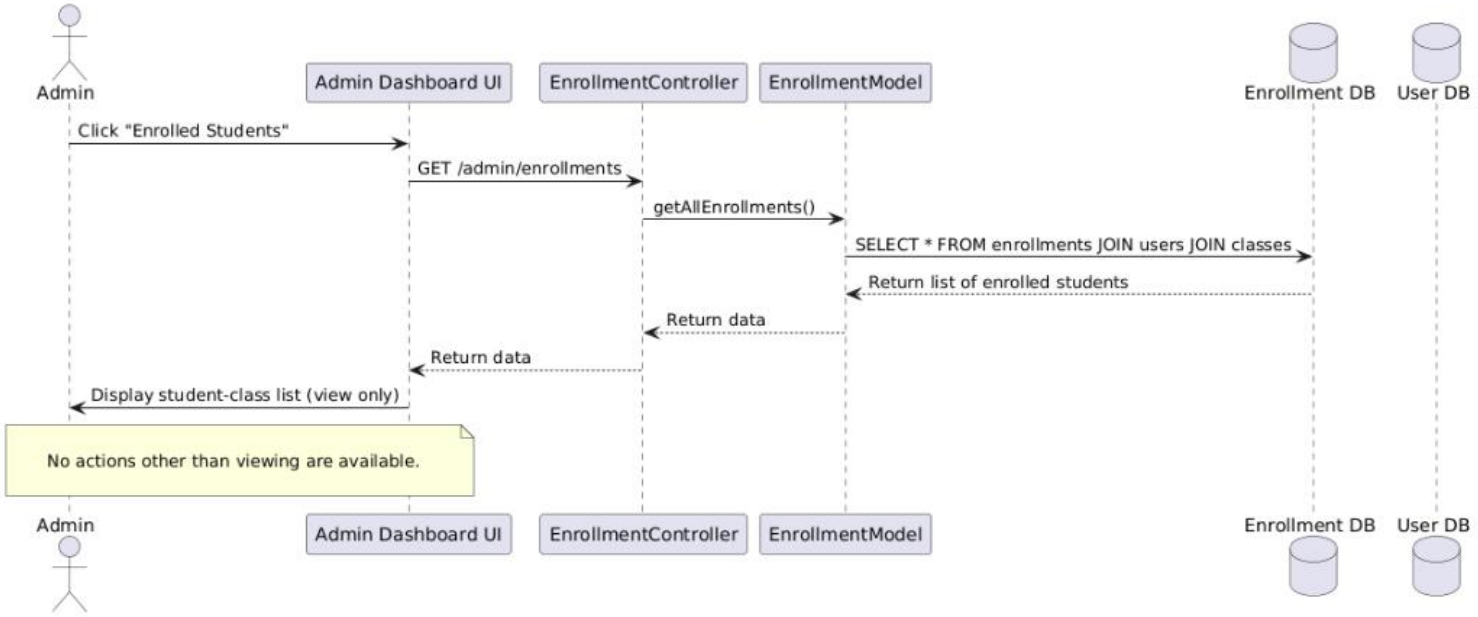

Figure B.20 Activity Diagram View Enrolled Students

Appendix C: Issues List

< No issue or indecisive decision for the time being>