
System Combined Requirements and Design Document (SCRD)

SIE Learning Management System™

Version 1.0 approved

<4/27/22>

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1. Introduction

1.1 Purpose

This System Combined Requirements & Design Document (SCRD) version 1.0 is intended to identify the top level technical requirements, processes, dataflows, and design of a system to be used in managing and delivering learning content being made by SIE Corporation. This system shall be called LMS (Learning Management System). The LMS is being made to provide instructors a more efficient way of delivering and managing learning content. This document entails three of the four subsystems of LMS.

1.2 Document Conventions

Page numbers are centered at the top of each page. Bolded words in bigger font size are section titles. Bolded words in smaller font size are subsection titles.

1.3 Intended Audience and Reading Suggestions

This version – version 1.0 - provides general descriptions of the system. The system developer should review the document to ensure there is adequate information for defining an initial design of the system. The users should review the document to affirm the features described are needed, to clarify features, and to identify additional features needed within the system. The next version – version 2.0 – will be the result of more detailed requirements analysis. When version 2.0 is written, the system developer and users will be asked to review this document. The document is structured to follow IEEE 830-1998 standards for recording system requirements.

1.4 System Scope

The LMS shall enable instructors to deliver learning content to students, allow students to take online assessments, and provide helpful analytics to both students and instructors. The purpose of the LMS is to provide a more efficient and effective way for instructors and students. The LMS helps deliver on the company's goal to provide tools which improve aspects of education systems.

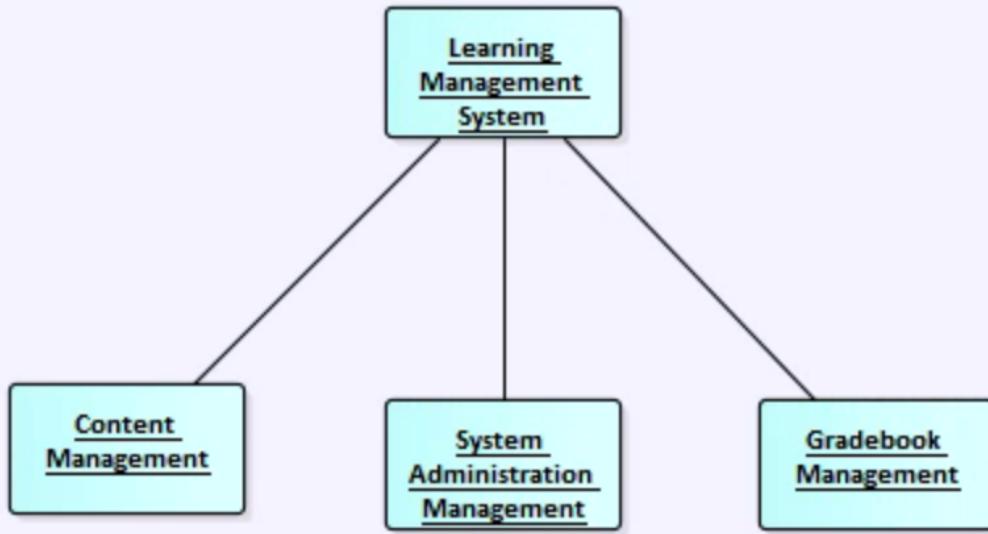
1.5 References

All diagrams are from Enterprise Architect file ‘semproj.eapx’.

2. Overall Description

2.1 System Perspective

The LMS is a new, self-contained system that may be used to replace existing learning systems currently in use. The below diagram shows how the LMS splits into three subsystems which are: Content Management, System Administration Management, Gradebook Management.



2.2 System Functions

The LMS has five main functions that it must carry out. These functions include:

- Let the instructor add, modify, and delete content
- Let the system administrator add, modify, and delete users
- Let the instructor add, modify, and delete gradebook items
- Let the instructor modify and view grades
- Let the student view grades

2.3 User Classes and Characteristics

The LMS contains three user classes they are the following:

- Student
Students are the lowest authorized users. Students will be one of the two primary users of the LMS. They will use the LMS to learn. They will only be able to view content and view grades.
- Instructors
Instructors have the second highest authorization level. They will be one of the two primary users of LMS. They will use this system to instruct students. They will be able to add, modify, and delete content and gradebook items. Also, they will have the ability to modify grades.

- System Administrators

System administrators have the highest authorization level. They will use the LMS the least out of the three user classes. They will use the system to administer other users. They will have the ability to add, modify, and delete users. Modifying includes setting other users' authorization level.

2.4 Operating Environment

The LMS will operate on the web. It will be offered as a software as a service on the web. It will store all its data on a cloud support system. It will be accessible through any device that can access the web. For example, a PC or smartphone would be able to access this system.

2.5 Design and Implementation Constraints

There will be many constraints placed on the LMS which are:

- It will only be offered to educational organizations
- Data must be small enough to fit in the cloud's storage capacity
- The only language it will be offered in is English
- It will only allow users who can authenticate their account through an email
- It will be maintained by software engineers hired by SIE Corporation
- It will only allow videos to be uploaded through YouTube
- It will follow conventional programming standards
- It will be offered through a monthly or annual subscription

2.6 Assumptions and Dependencies

There are multiple assumed factors which are:

- The user will have access to a computer capable of running a web browser
- The user has a stable connection to the internet

3. External Interface Requirements

3.1 User Interfaces

The GUIs shall appear within similar theme with a blue background and different shades of blue for selectable buttons. A description of the GUI function shall appear centered at the top of each GUI. A 'Cancel' button shall appear at the bottom right of every GUI, meanwhile either a 'Submit' or 'Delete' button will appear to its left depending on the necessary function. In the case of selecting 'Delete', a confirmation message shall display with the options of either 'Yes' to confirm deletion or 'Cancel'. Each subsystem shall have its own MainGUI which can direct the user to a specific use case. Every use case shall display a GUI with unique description of the active use case (previously described centered at the top).

3.2 Hardware Interfaces

The LMS system may be accessed by any device with the capability to run a web browser. For the device to properly display the data stored in the LMS, it must be able to display multiple data types such as PDF's or MS Word documents.

3.3 Software Interfaces

LMS will use the standard software resources given by the SIE Corporation. This includes but is not limited to Enterprise Architect, C++, and JavaScript.

3.4 Communications Interfaces

LMS will use the communications resources provided by SIE Corporation. This includes HTTP protocol for communication with the web and its server.

4. Requirements

4.1 Functional Requirements

FR-1: Gradebook Management (GM)

FR-1.1: The GM subsystem shall allow the instructor to add, modify, and delete gradebook items for a course.

FR-1.2: The GM subsystem shall provide the capability for the instructor to manage graded assessments.

FR-1.3: The GM subsystem shall provide the capability for the instructor to post grades for each student for each assessment.

FR-1.4: The GM subsystem shall allow students to view all posted grades.

FR-2: Content Management

FR-2.1: The CM subsystem shall allow the instructor to add, modify, and delete content.

FR-2.2: The CM subsystem shall allow videos to be linked to (external link).

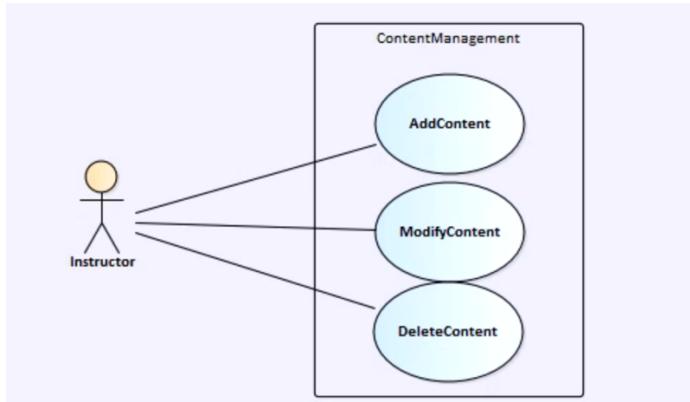
FR-3: System Administration Management (SAM)

FR-3.1: The SAM system shall allow the system administrator to add, modify, and delete users.

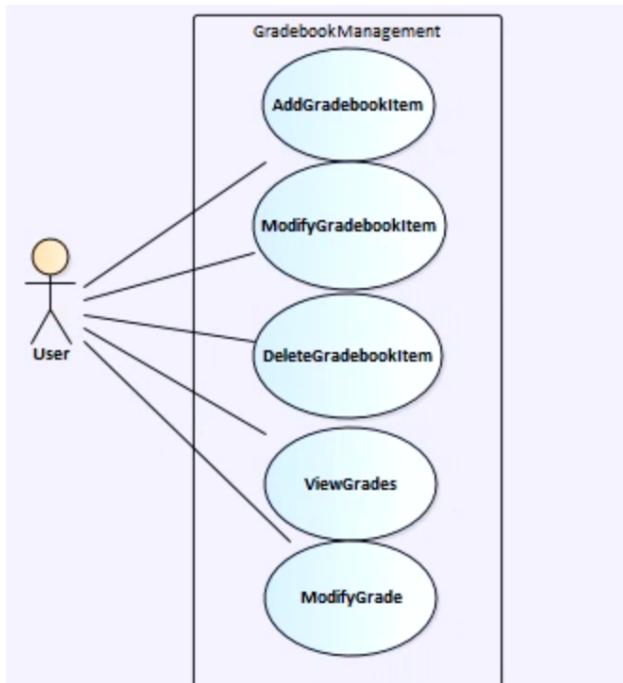
FR-3.2: The SAM system shall allow two types of users, instructors, and students.

FR-3.3: The SAM system shall allow each user to have the following information: username, password, email address, and authorization level.

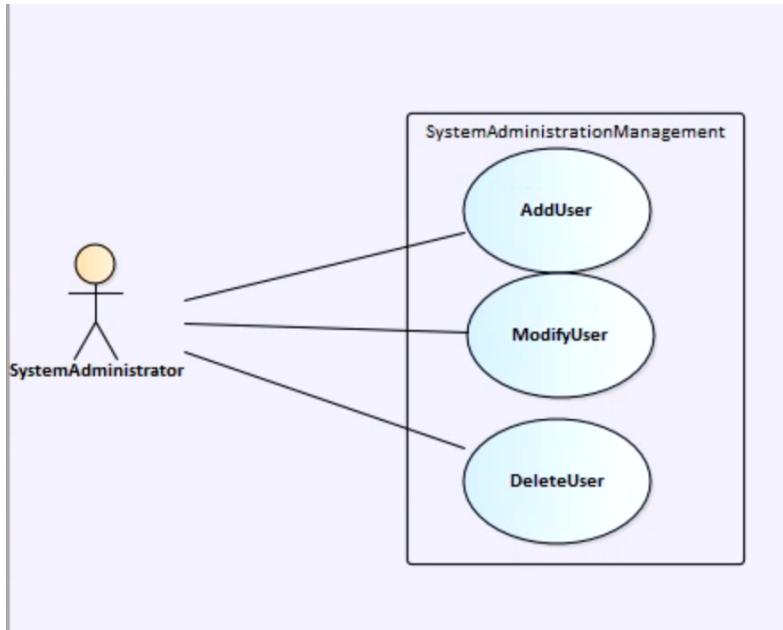
Use Case Diagrams:



Use case diagram for ContentManagement, with Instructor as the primary actor. Use cases include AddContent, ModifyContent, and DeleteContent. The system boundary is ContentManagement.



Use case diagram for GradebookManagement, with User as the primary actor. Use cases include AddGradebookItem, ModifyGradebookItem, DeleteGradebookItem, ViewGrades, and ModifyGrade. The system boundary is GradebookManagement.



Use case diagram for SystemAdministrationManagement, with SystemAdministrator as the primary actor. Use cases include AddUser, ModifyUser, and DeleteUser. The system boundary is SystemAdministrationManagement.

Use Case Specifications:

SystemAdministrationManagement Specifications:

Use Case: AddUser
ID: SAM-1
Brief Description: The SystemAdministrator adds a user to the LMS.
Primary Actor: SystemAdministrator
Secondary Actors: None.
Precondition: The SystemAdministrator is logged into the LMS and is currently viewing the System Administration Management MainGUI.
Main Flow:
<ol style="list-style-type: none"> The use case begins when the SystemAdministrator selects the 'Add User' button on the System Administration Management MainGUI. The system displays the SAMGUI. The Instructor enters details for the new user including Username, Password, Email Address, and Authorization. The Instructor selects the 'Submit' button on the SAMGUI. The system saves the new user information. The use case ends.
PostCondition: The new user has been added to the LMS.
Alternative Flow: None.

Use Case: ModifyUser
ID: SAM-2
Brief Description: The SystemAdministrator modifies an existing LMS user.
Primary Actor: SystemAdministrator
Secondary Actors: None.
Precondition: The SystemAdministrator is logged into the LMS and is currently viewing the System Administration Management MainGUI.
Main Flow:
<ol style="list-style-type: none">a. The use case begins when the SystemAdministrator selects the ‘Modify User’ button on the System Administration Management MainGUI.b. The system displays the SAMGUI.c. The Instructor selects an existing user under the ‘Username’ section on the SAMGUI.d. The Instructor modifies the username, password, email address, and authorization level.e. The Instructor selects the ‘Submit’ button on the SAMGUI.f. The system saves the new user information.g. The use case ends.
PostCondition: The new user information is saved to the LMS.
Alternative Flow: None.

Use Case: DeleteUser
ID: SAM-3
Brief Description: The SystemAdministrator deletes a user on the LMS.
Primary Actor: SystemAdministrator
Secondary Actors: None.
Precondition: The SystemAdministrator is logged into the LMS and is currently viewing the System Administration Management MainGUI.
Main Flow:
<ol style="list-style-type: none">a. The use case begins when the SystemAdministrator selects the ‘Delete User’ button on the System Administration Management MainGUI.b. The system displays the SAMGUI.c. The Instructor selects an existing user under the ‘Username’ section on the SAMGUI.d. The Instructor selects the ‘Delete’ button on the SAMGUI.e. The system displays a confirmation message.f. The Instructor selects the ‘Yes’ button on the confirmation message.g. The system deletes the user.h. The use case ends.
PostCondition: The existing user is deleted on the LMS.
Alternative Flow: None.

ContentManagement Specifications:

Use Case: AddContent
ID: CM-1
Brief Description: The Instructor adds new content to the LMS.
Primary Actor: Instructor
Secondary Actors: None
Precondition: The Instructor is logged into the LMS and is currently viewing the Content Management MainGUI.
<p>Main Flow:</p> <ul style="list-style-type: none"> a. The use case begins when the Instructor selects the ‘Add Content’ button on the Content Management MainGUI. b. The system displays the ContentDetailGUI. c. The Instructor enters details for the new content including content name and content type. d. The Instructor selects the ‘UPLOAD CONTENT’ button on the ContentDetailGUI. e. The Instructor uploads the content on their files. f. The Instructor selects the ‘Submit’ button on the ContentDetailGUI. g. The system saves the new content. h. The use case ends.
PostCondition: The new content has been added to the LMS.
Alternative Flow: None.

Use Case: ModifyContent
ID: CM-2
Brief Description: The Instructor modifies existing content.
Primary Actor: Instructor
Secondary Actors: None
Precondition: The Instructor is logged into the LMS and is currently viewing the Content Management MainGUI.
<p>Main Flow:</p> <ul style="list-style-type: none"> a. The use case begins when the Instructor selects the ‘Modify Content’ button on the Content Management MainGUI. b. The system displays the ContentDetailGUI. c. The Instructor selects an existing content under the ‘Content Name’ section on the ContentDetailGUI. d. The Instructor modifies the content name and content type e. The Instructor selects the ‘UPLOAD CONTENT’ button on the ContentDetailGUI. f. The Instructor uploads a new content on their files. g. The Instructor selects the ‘Submit’ button on the ContentDetailGUI. h. The system saves the modified content. i. The use case ends.
PostCondition: The modified content, content name, and content type are saved to the LMS.
Alternative Flow: None.

Use Case: DeleteContent
ID: CM-3
Brief Description: The Instructor deletes existing content.
Primary Actor: Instructor
Secondary Actors: None
Precondition: The Instructor is logged into the LMS and is currently viewing the Content Management MainGUI.
Main Flow:
<ol style="list-style-type: none"> a. The use case begins when the Instructor selects the ‘Delete Content’ button on the Content Management MainGUI. b. The system displays the ContentDetailGUI. c. The instructor selects a content displayed under the ‘Content Name’ section on the ContentDetailGUI. d. The Instructor selects the ‘Delete’ button on the ContentDetailGUI. e. The system displays a confirmation message. f. The Instructor selects the ‘Yes’ button on the confirmation message. g. The system deletes the content. h. The use case ends.
PostCondition: The existing content is deleted on the LMS.
Alternative Flow: None.

GradebookManagement Specifications:

Use Case: AddGradebookItem
ID: GM-1
Brief Description: The User adds a gradebook item to the LMS.
Primary Actor: User
Secondary Actors: None
Precondition: The User is logged into the LMS as an instructor and is currently viewing the Gradebook Management MainGUI.
Main Flow:
<ol style="list-style-type: none"> a. The use case begins when the User selects the ‘Add Gradebook Item’ button on the Gradebook Management MainGUI. b. The system displays the GradebookGUI. c. The User enters details for the new gradebook item including Name, Total Points, and Type. d. The User selects the ‘Submit’ button on the GradebookGUI. e. The system saves the new gradebook item. f. The use case ends.
PostCondition: The new gradebook item is saved to the LMS.
Alternative Flow: None.

Use Case: ModifyGradebookItem
ID: GM-2
Brief Description: The User modifies an existing LMS gradebook item.
Primary Actor: User
Secondary Actors: None
Precondition: The User is logged into the LMS as an instructor and is currently viewing the Gradebook Management MainGUI.
Main Flow:
<ol style="list-style-type: none"> a. The use case begins when the User selects the 'Modify Gradebook Item' button on the Gradebook Management MainGUI. b. The system displays the GradebookGUI. c. The User selects an existing gradebook item under the 'Name' section on the GradebookGUI. d. The User modifies the Name, Total Points, and Type. e. The User selects the 'Submit' button on the GradebookGUI. f. The system saves the new gradebook item information. g. The use case ends.
PostCondition: The new gradebook item information is saved to the LMS.
Alternative Flow: None.

Use Case: DeleteGradebookItem
ID: GM-3
Brief Description: The User deletes a gradebook item on the LMS.
Primary Actor: User
Secondary Actors: None
Precondition: The User is logged into the LMS as an instructor and is currently viewing the Gradebook Management MainGUI.
Main Flow:
<ol style="list-style-type: none"> a. The use case begins when the User selects the 'Delete Gradebook Item' button on the Gradebook Management MainGUI. b. The system displays the GradebookGUI. c. The User selects an existing gradebook item under the 'Name' section on the GradebookGUI. d. The User selects the 'Delete' button on the GradebookGUI. e. The system displays a confirmation message. f. The User selects the 'Yes' button on the confirmation message. g. The system deletes the gradebook item. h. The use case ends.
PostCondition: The gradebook item is deleted on the LMS.
Alternative Flow: None.

Use Case: ViewGrades
ID: GM-4
Brief Description: The User views the grades of a selected user on the LMS.
Primary Actor: User
Secondary Actors: None
Precondition: The User is logged into the LMS and is currently viewing the Gradebook Management MainGUI.
Main Flow:
<ol style="list-style-type: none"> a. The use case begins when the User selects the ‘View Grades’ button on the Gradebook Management MainGUI. b. The system displays the GradeGUI. c. The User selects a user’s grades to view under the ‘Username’ section on the GradeGUI. d. The system displays the selected user’s grades. e. The use case ends.
PostCondition: None.
Alternative Flow: None.

Use Case: ModifyGrade
ID: GM-5
Brief Description: The User modifies the grades of a selected user on the LMS.
Primary Actor: User
Secondary Actors: None
Precondition: The User is logged into the LMS as an instructor and is currently viewing the Gradebook Management MainGUI.
Main Flow:
<ol style="list-style-type: none"> a. The use case begins when the User selects the ‘Modify Grade’ button on the Gradebook Management MainGUI. b. The system displays the GradeGUI. c. The User selects a user whose grade is to be modified under the ‘Username’ section on the GradeGUI. d. The system displays the selected user’s grades. e. The User selects a gradebook item whose grade is to be modified. f. The User modifies the grade of the gradebook item. g. The User selects the ‘Submit’ button on the GradeGUI. h. The system saves the new gradebook grade. i. The use case ends.
PostCondition: The user’s new gradebook item grade is saved to the LMS
Alternative Flow: None.

4.2 Nonfunctional Requirements

4.2.1 Performance Requirements

PR-1: Storage Capacity

The LMS shall allow 50 TB of cloud storage to store data.

PR-2: Response Time

The LMS shall respond to a user input within a period of 5 seconds.

PR-3: Load Time

The LMS shall load GUI's, save data, and display content within a period of 10 seconds after user input. The LMS shall upload content within a period of 15 seconds after user interaction.

4.2.2 Safety Requirements

SAR-1: Data Storage

The LMS shall maintain a backup of cloud data that may only be accessed in the case that connection to the main server as well as LMS data is lost.

4.2.3 Security Requirements

SER-1: Privacy

The LMS shall establish a secure and confidential connection between the user and server.

SER-2: Authentication

The LMS shall authenticate user login by username and password.

SER-3: Authorization

The LMS shall only allow users logged in with instructor authentication level to access certain features such as modify grades, delete grades, add content, modify content, and delete content. Only users logged into the system with system administrator authentication level shall access certain features such as add new user, modify user, and delete user.

SER-4: Confidentiality

The LMS shall maintain its data within the system without sharing data with third party systems.

4.2.4 Software Quality Attributes

SQ-1: Portability

The LMS shall be built to be used on systems that may access the web including mobile and desktop platforms.

SQ-2: Availability

The LMS shall be always accessible to users after being deployed.

SQ-3: Reliability

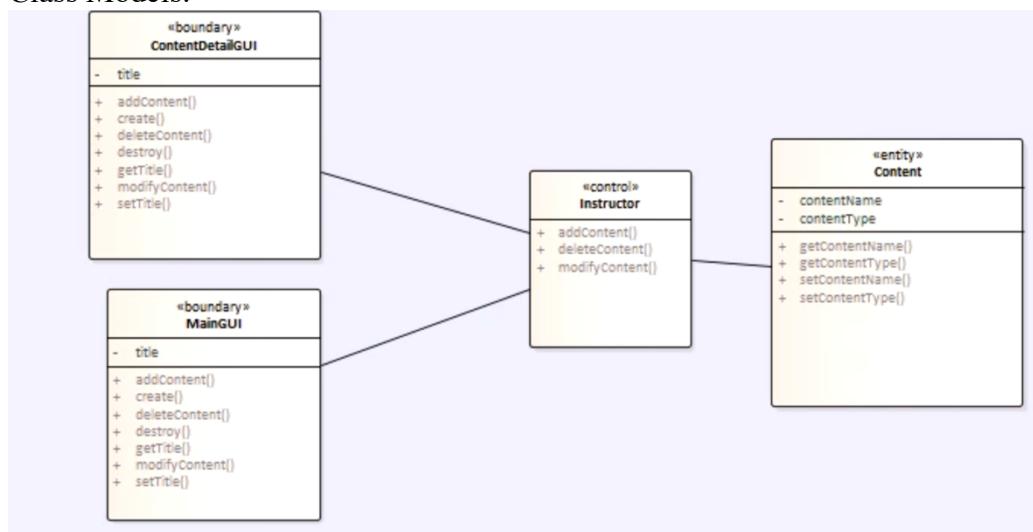
The LMS shall allow over 100 users to access the system at a given time while continuing operation.

SQ-4: Versatility

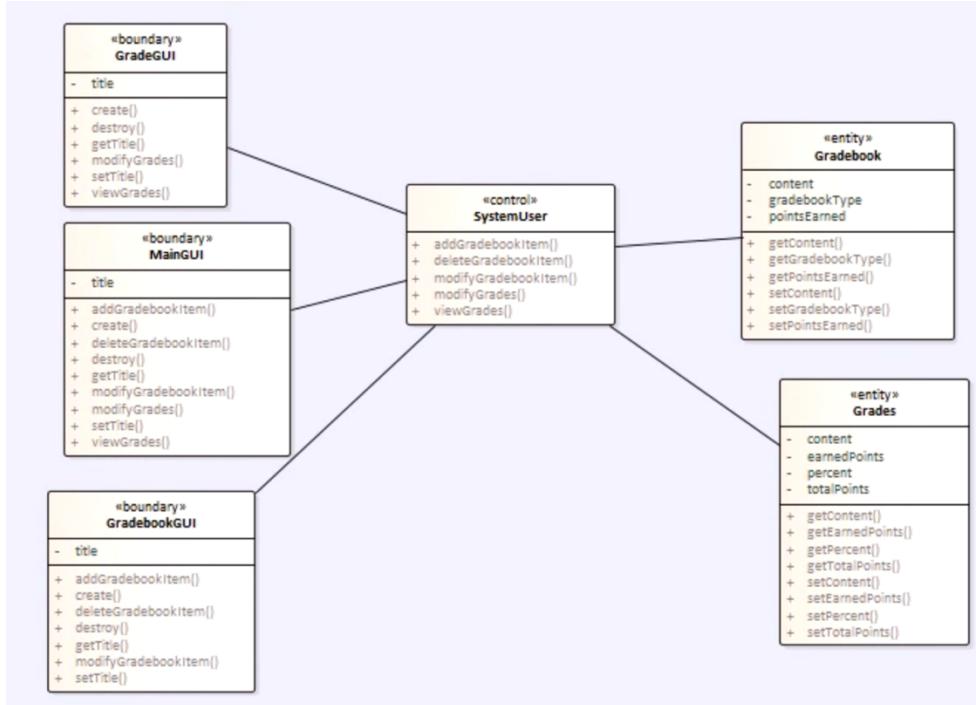
The LMS shall support multiple content types to be uploaded including PDF's, MS Word documents, MS Excel files, external links, and images.

5. Analysis

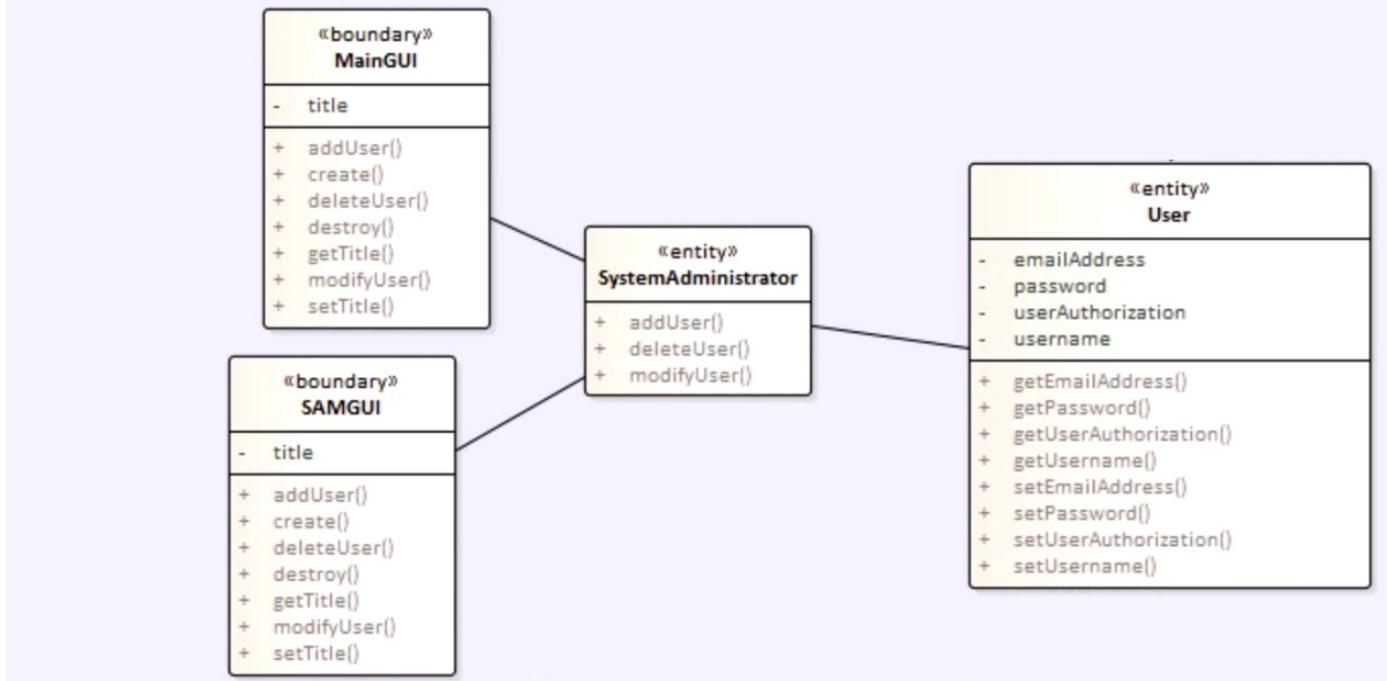
Class Models:



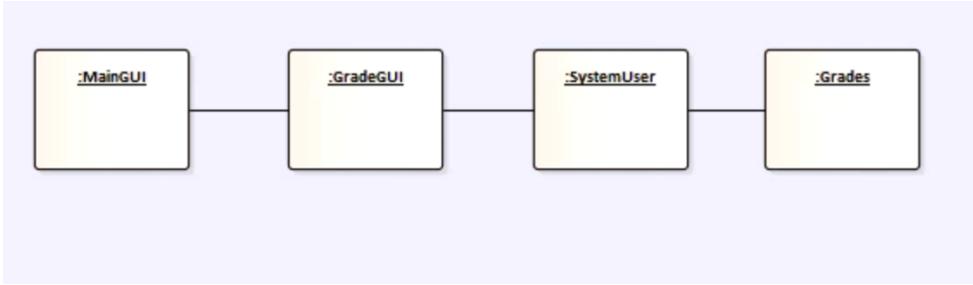
This is the content management class model. The boundary classes are ContentDetailGUI and MainGUI. The control class is Instructor. The entity class is content.



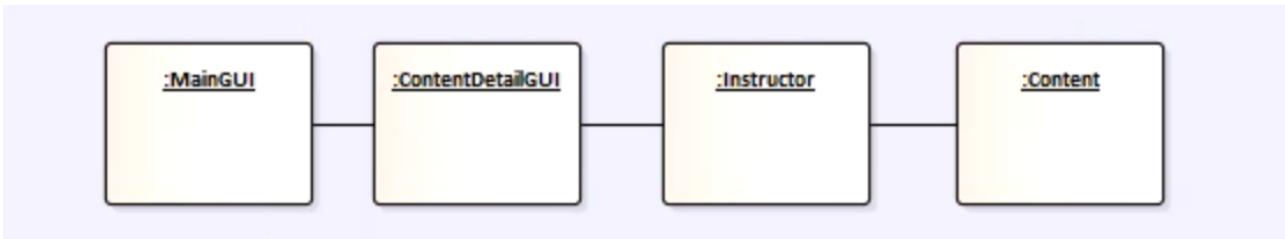
This is the *system administration* management class model. The boundary classes are GradesGUI, GradebookGUI and MainGUI. The control class is SystemUser. The entity classes are Gradebook and Grades.



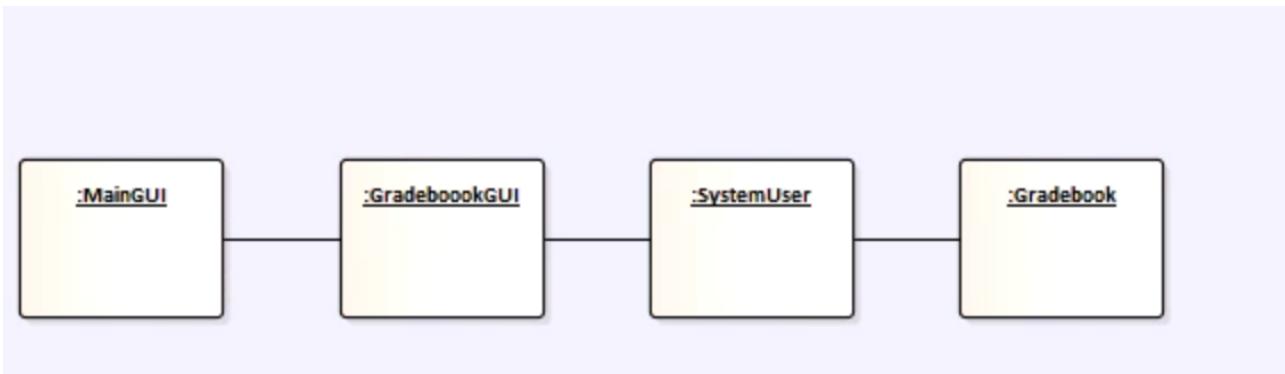
This is the system administration management class model. The boundary classes are SAMGUI and MainGUI. The control class is SystemAdministrator. The entity class is user.



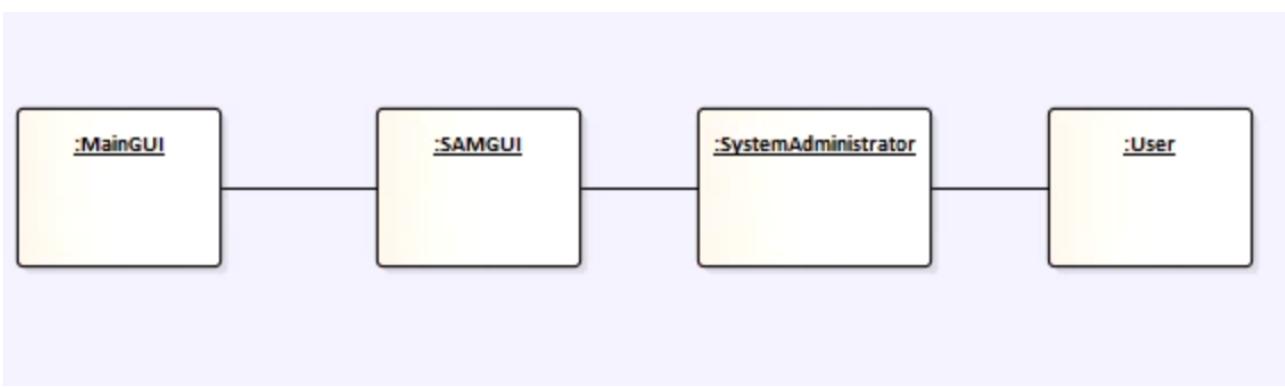
This is the object model that pertains to use cases ViewGrades and ModifyGrades. It shows the flow from MainGUI, to GradesGUI, to SystemUser, to Grades.



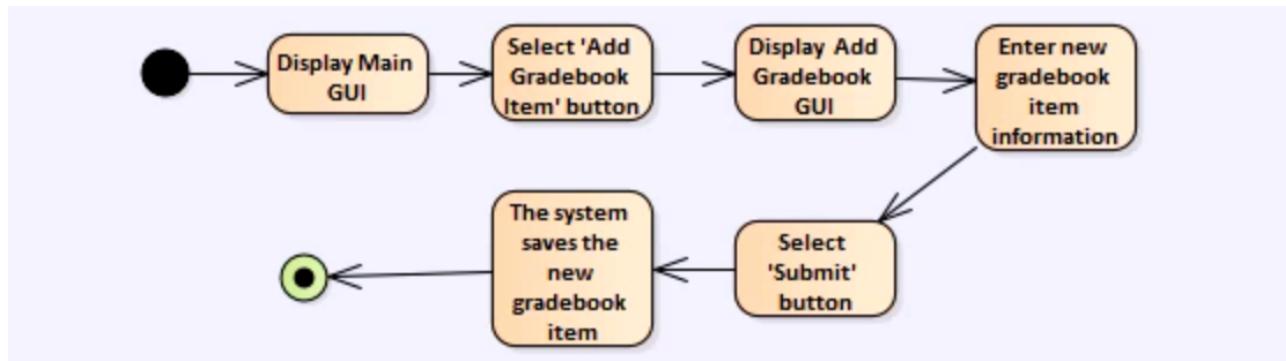
This is the object model that pertains to use cases AddContent, ModifyContent, and DeleteContent. It shows the flow from MainGUI, to ContentDetailGUI, to Instructor, to Content.



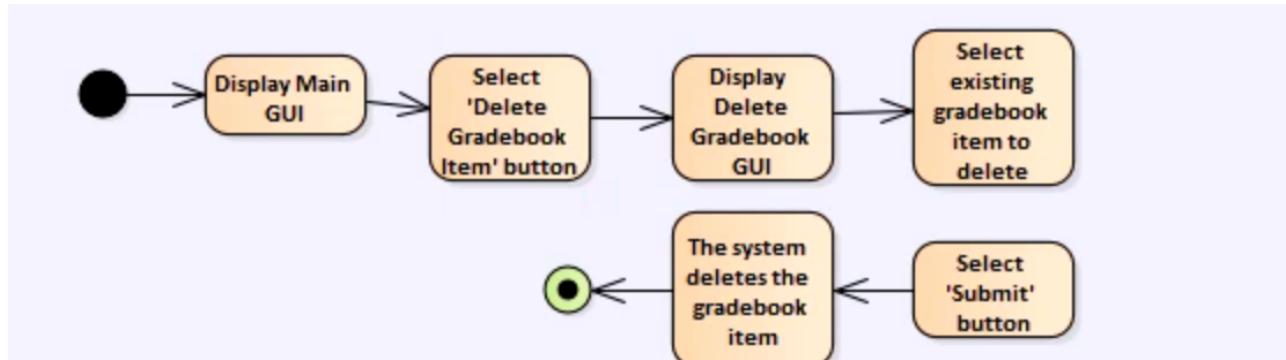
This is the object model that pertains to use cases AddGradebookItem, ModifyGradebookItem and DeleteGradebookItem. It shows the flow from MainGUI, to GradebookGUI, to SystemUser to Gradebook.



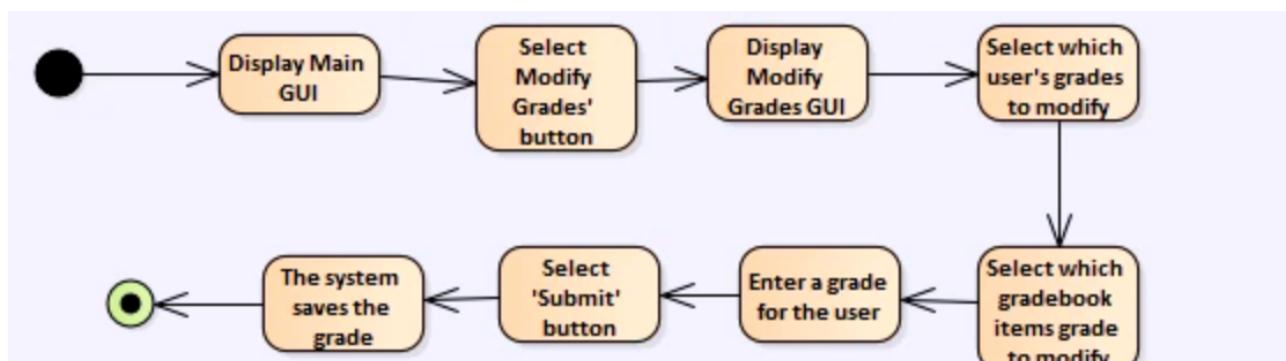
This is the object model that pertains to use cases AddUser, ModifyUser and DeleteUser. It shows the flow from MainGUI, to SAMGUI, to SystemAdministrator, to User.



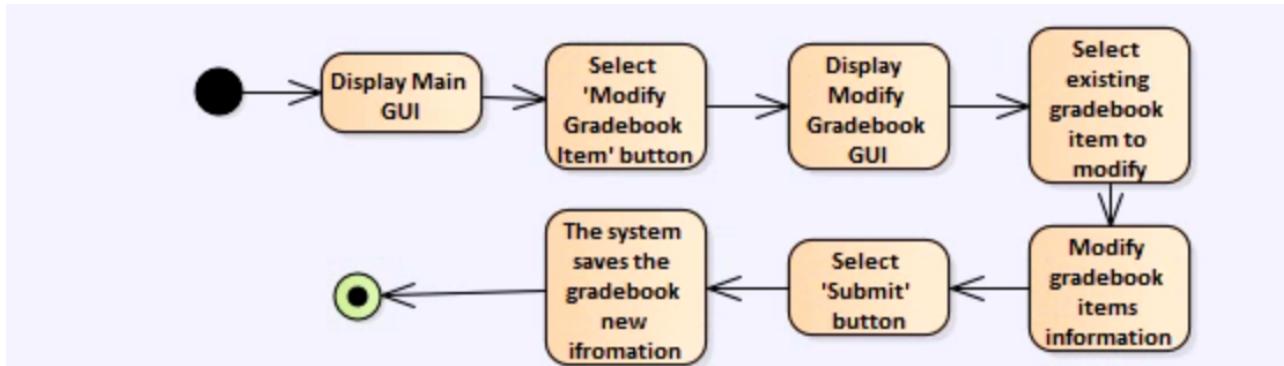
This is the activity diagram for the use case AddGradebookItem. It shows a step by step of how the use case is executed.



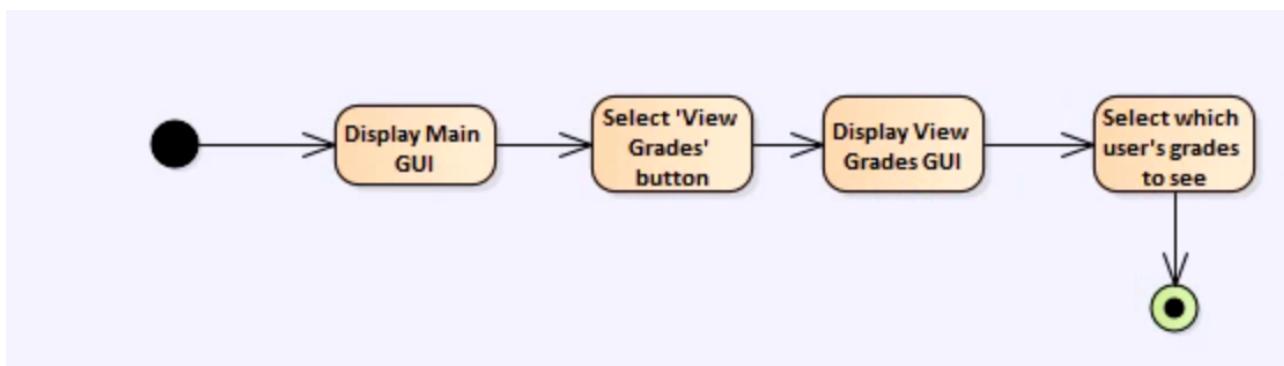
This is the activity diagram for the use case DeleteGradebookItem. It shows a step by step of how the use case is executed.



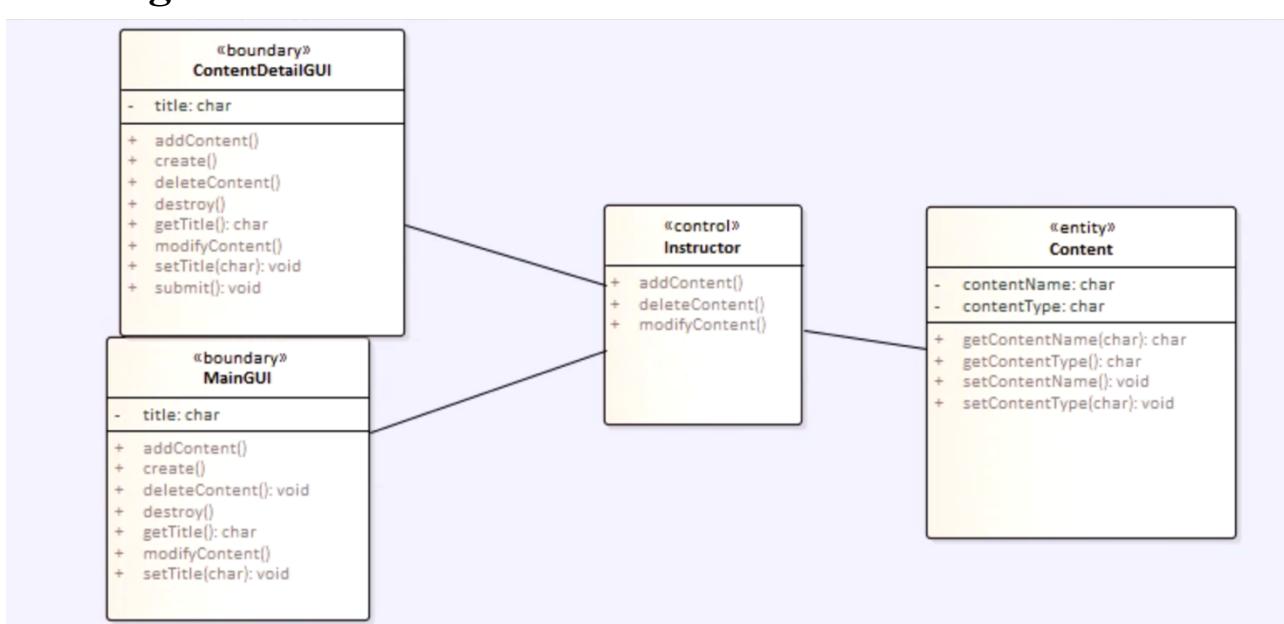
This is the activity diagram for the use case ModifyGrades. It shows a step by step of how the use case is executed.



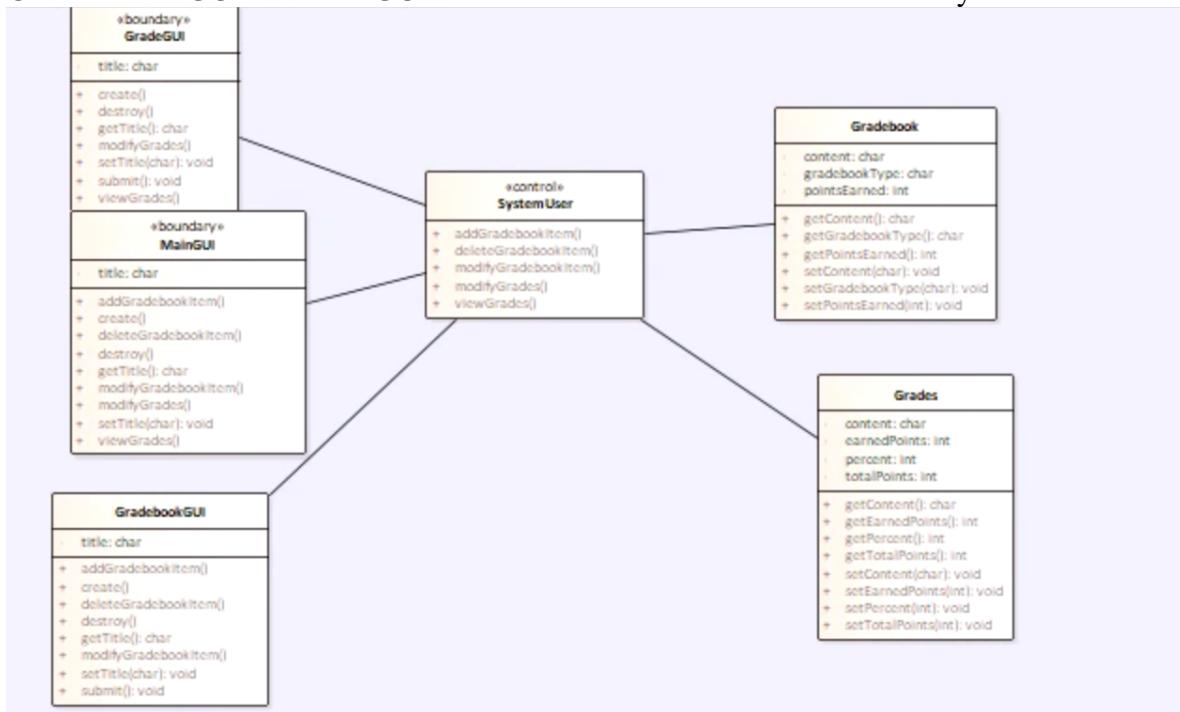
This is the activity diagram for the use case ModifyGradebookItem. It shows a step by step of how the use case is executed.



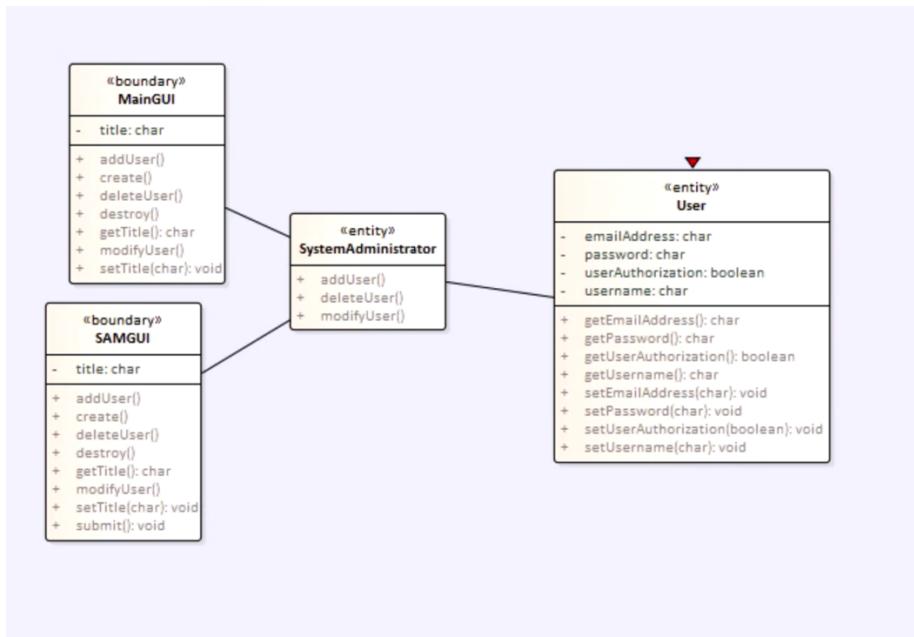
6. Design



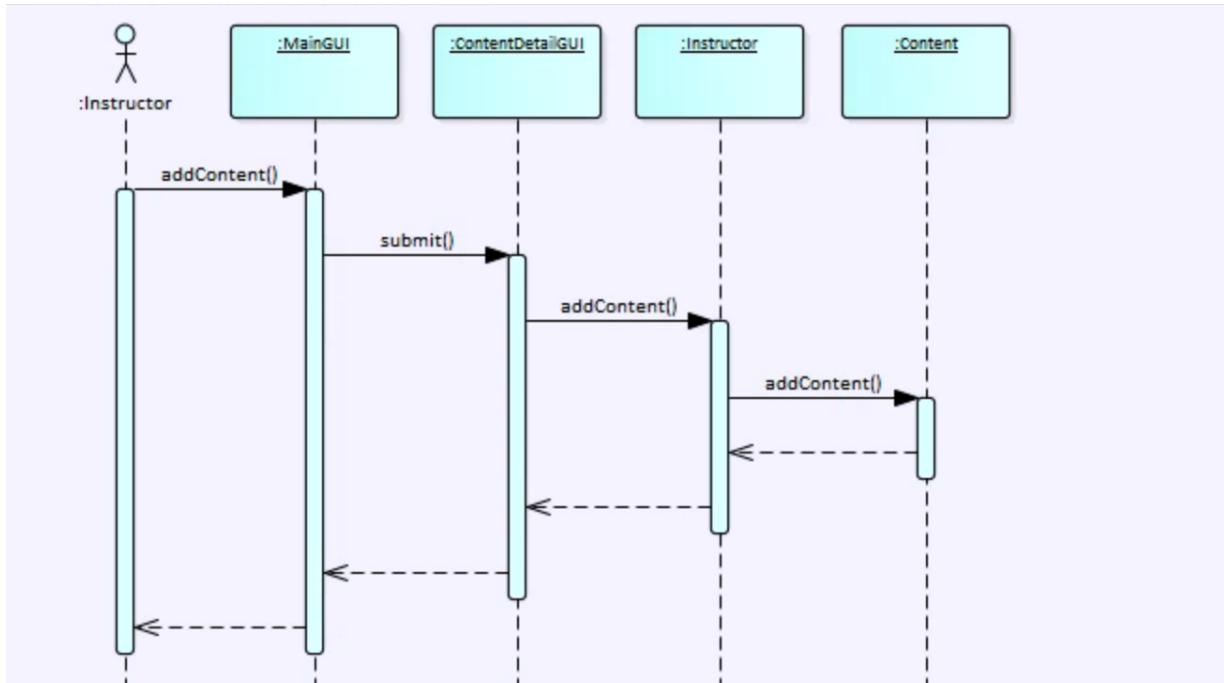
This is the content management design level class model. The boundary classes are ContentDetailGUI and MainGUI. The control class is Instructor. The entity class is content.



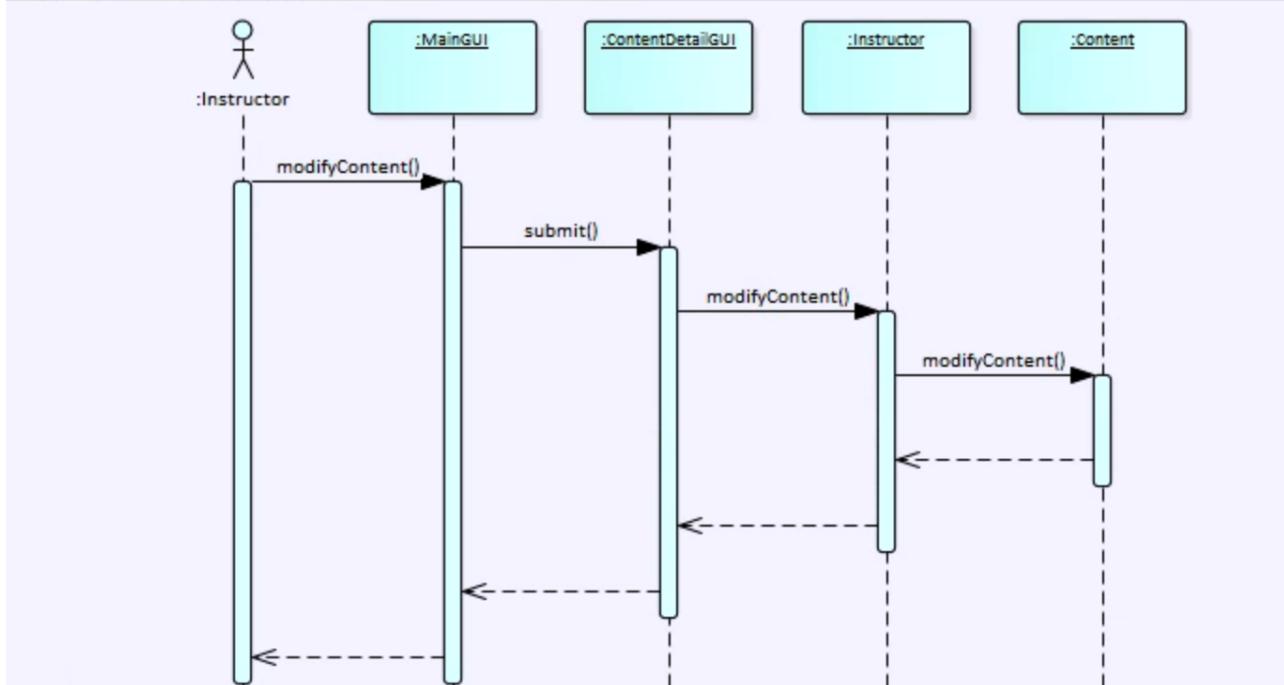
This is the gradebook management design level class model. The boundary classes are GradesGUI, GradebookGUI and MainGUI. The control class is SystemUser. The entity classes are Gradebook and Grades.



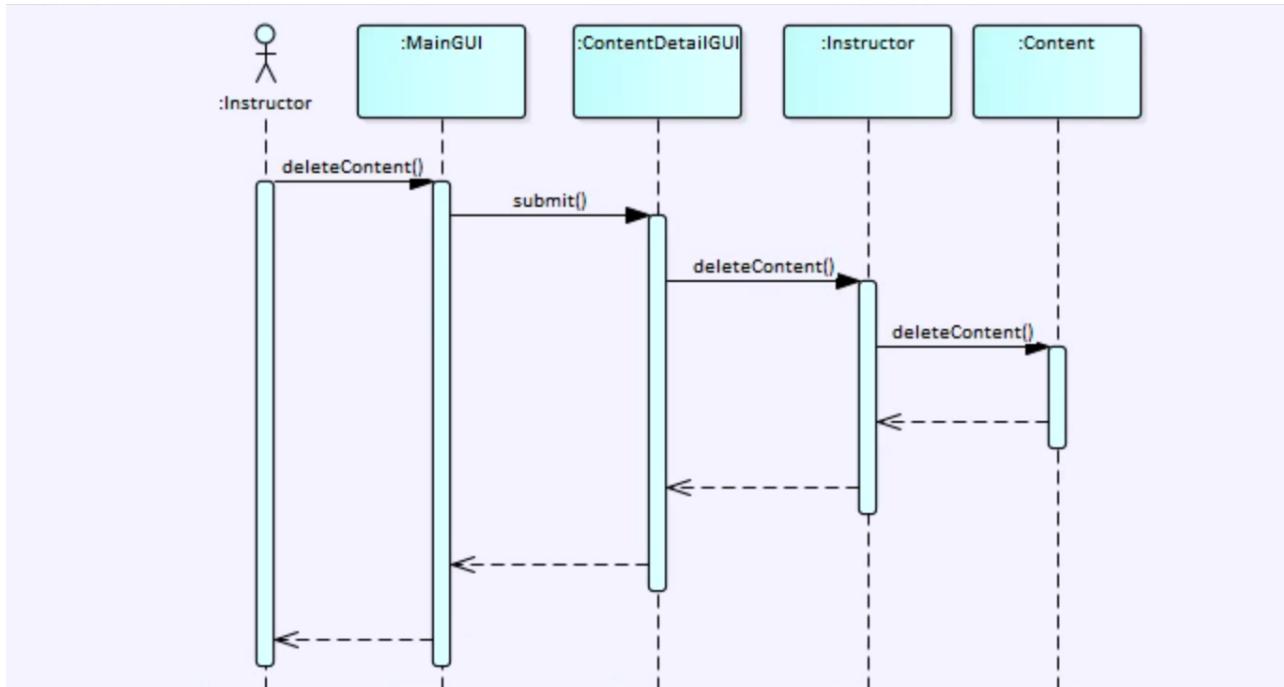
This is the system administration management design level class model. The boundary classes are SAMGUI and MainGUI. The control class is SystemAdministrator. The entity class is user.



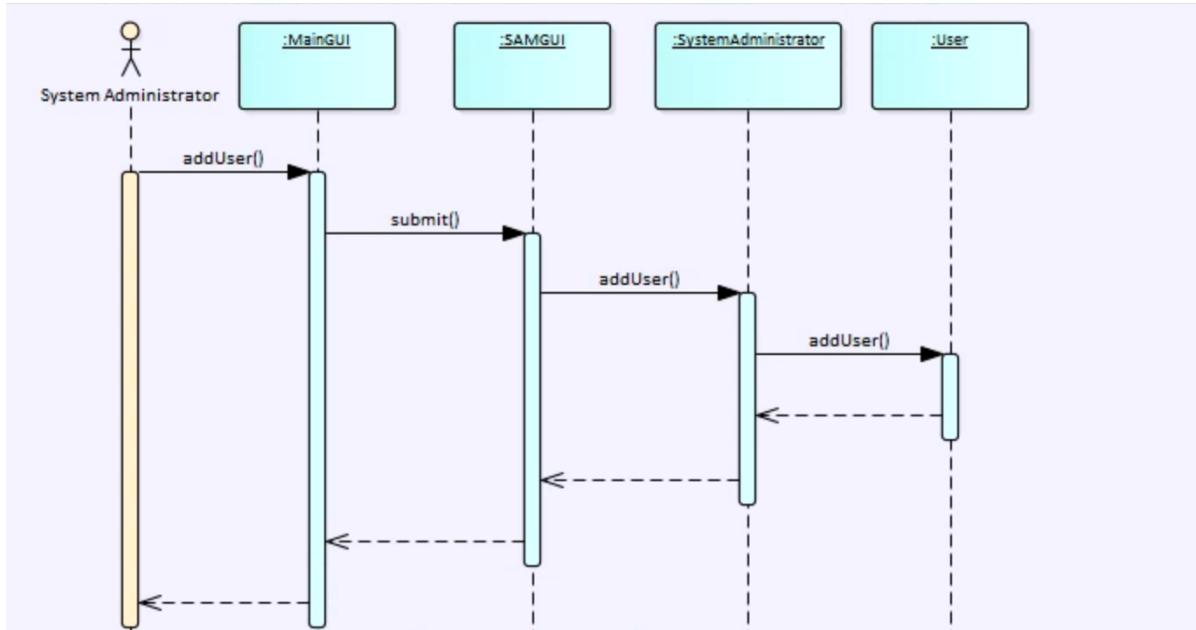
This sequence diagram pertains to the use case AddContent. It shows how the use case is executed step by step.



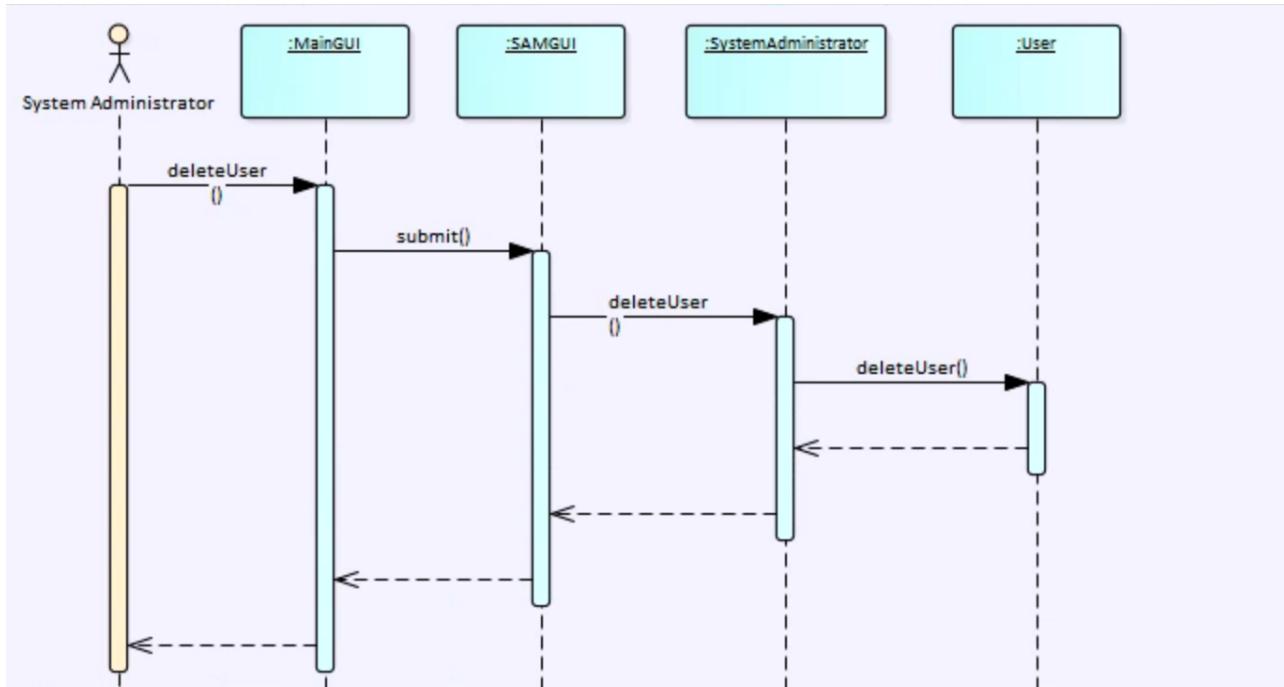
This sequence diagram pertains to the use case ModifyContent. It shows how the use case is executed step by step.



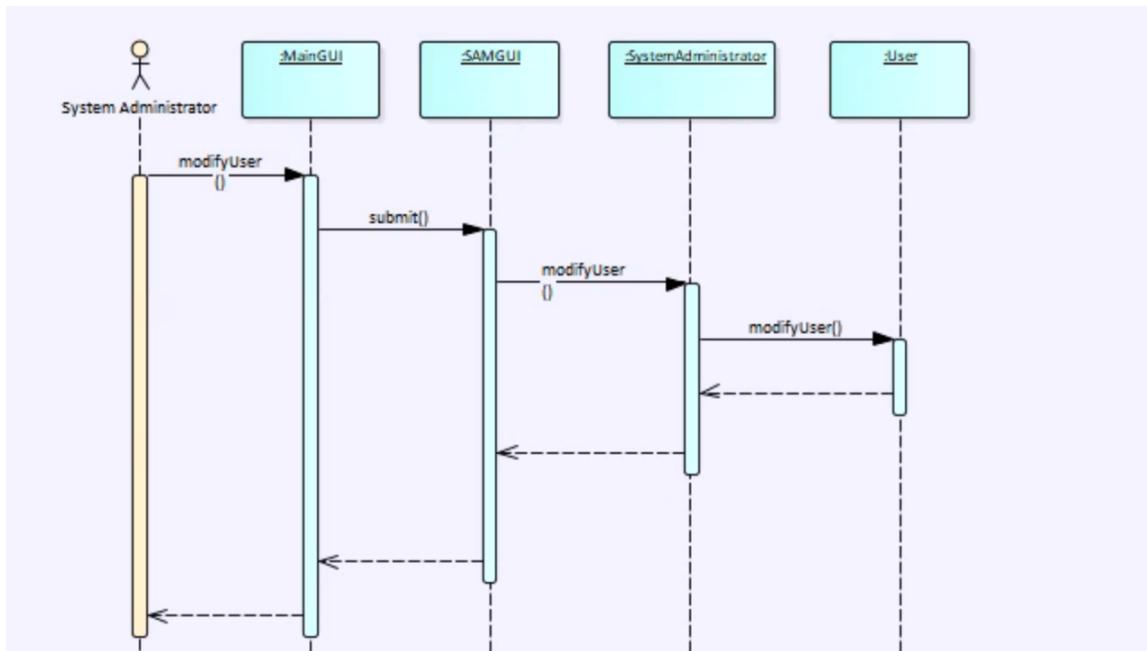
This sequence diagram pertains to the use case DeleteContent. It shows how the use case is executed step by step.



This sequence diagram pertains to the use case AddUser. It shows how the use case is executed step by step.



This sequence diagram pertains to the use case DeleteUser. It shows how the use case is executed step by step.



This sequence diagram pertains to the use case ModifyUser. It shows how the use case is executed step by step.

7. Implementation

Learning Management System Login

Username

Password

Login GUI

The Login GUI is the first GUI of the LMS to be displayed. It shall allow the user to enter their username and password in order to login.

Learning Management System

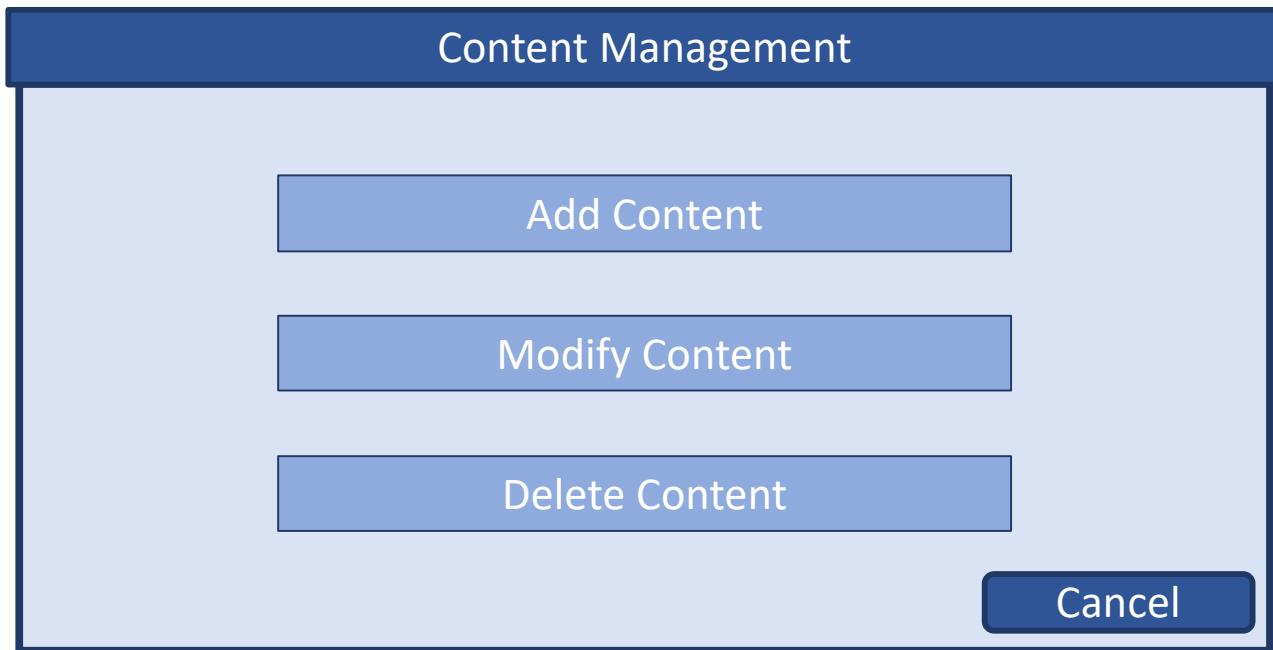




LMS MainGUI

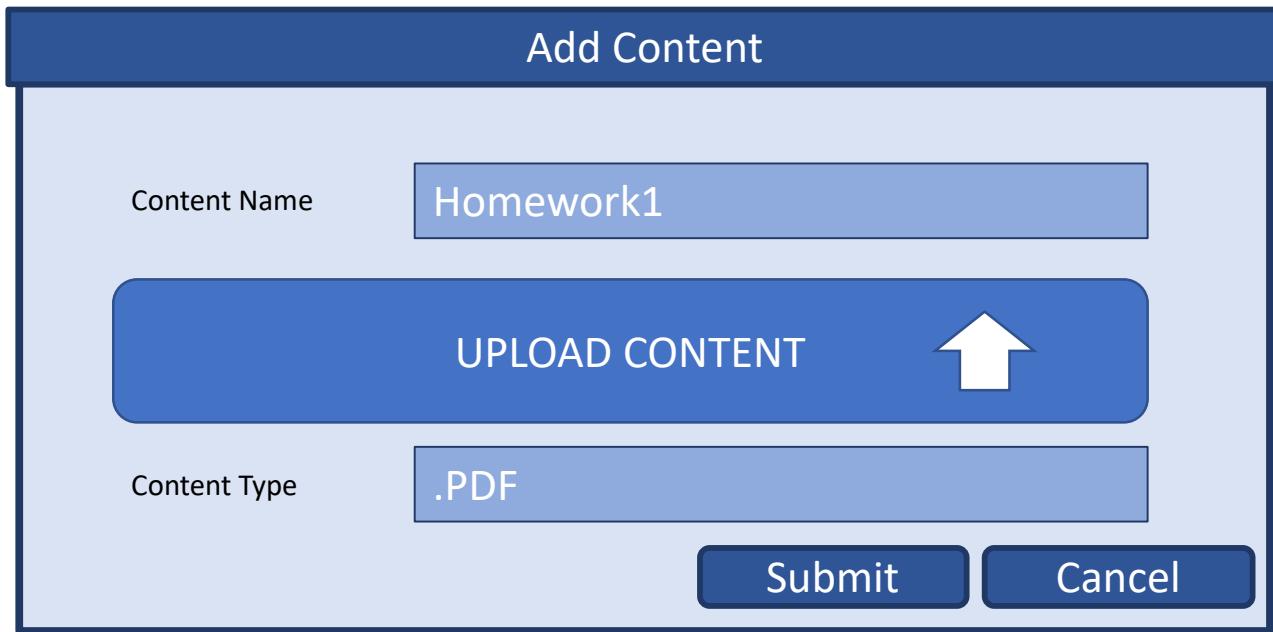
The LMS MainGUI allows the user to access either the Gradebook Management MainGUI, Content Management MainGUI, or System Administration Management MainGUI.

Content Management:



MainGUI – Content Management

The Content Management MainGUI allows the user to select whether to add, modify, or delete content. It redirects to the ContentManagementGUI.



ContentManagementGUI – Add Content

The ContentManagementGUI may allow the user to add content by entering content name, content type, and uploading the content itself.

Modify Content

Content Name

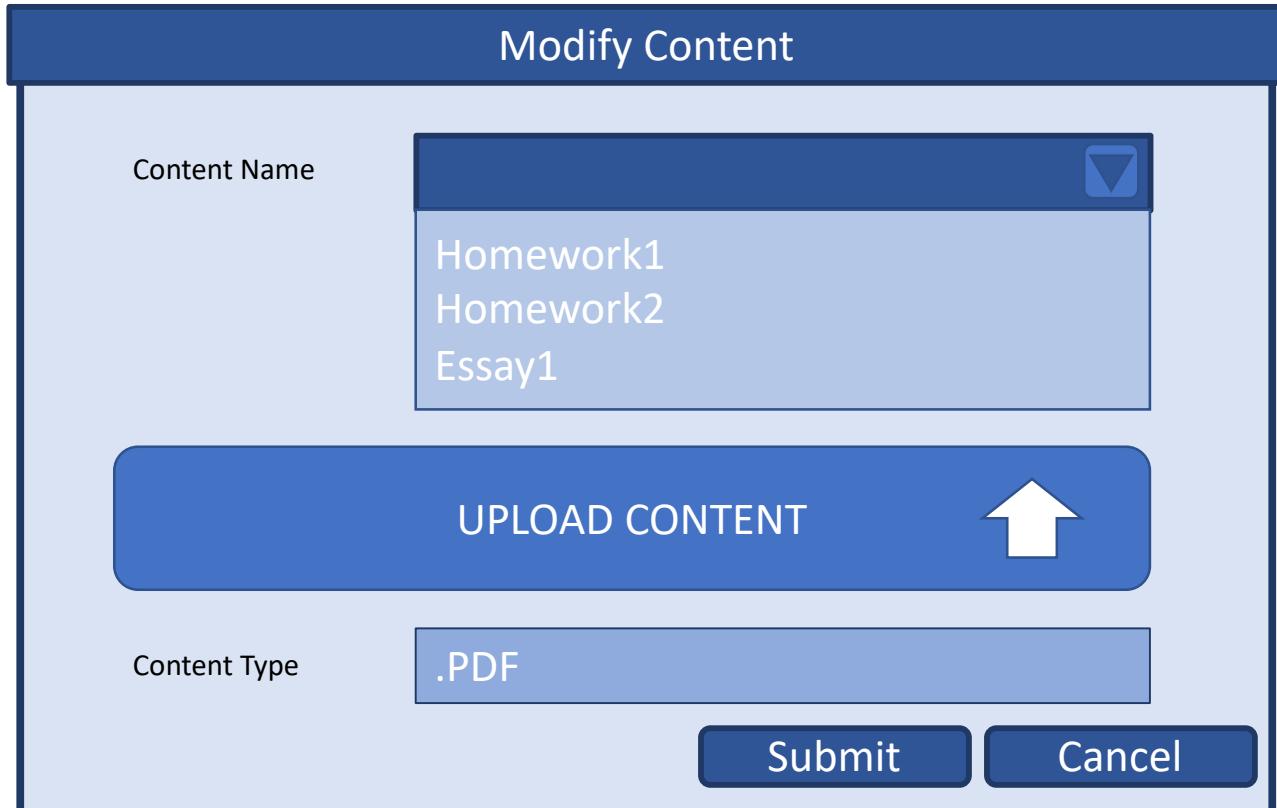
Homework1
Homework2
Essay1

UPLOAD CONTENT 

Content Type

.PDF

Submit **Cancel**



ContentManagementGUI – Modify Content

The ContentManagementGUI may allow the user to modify content by selecting content name and modifying content name, content type, and uploading new content.

Delete Content

Content Name

Homework1
Homework2
Essay1

Content Type

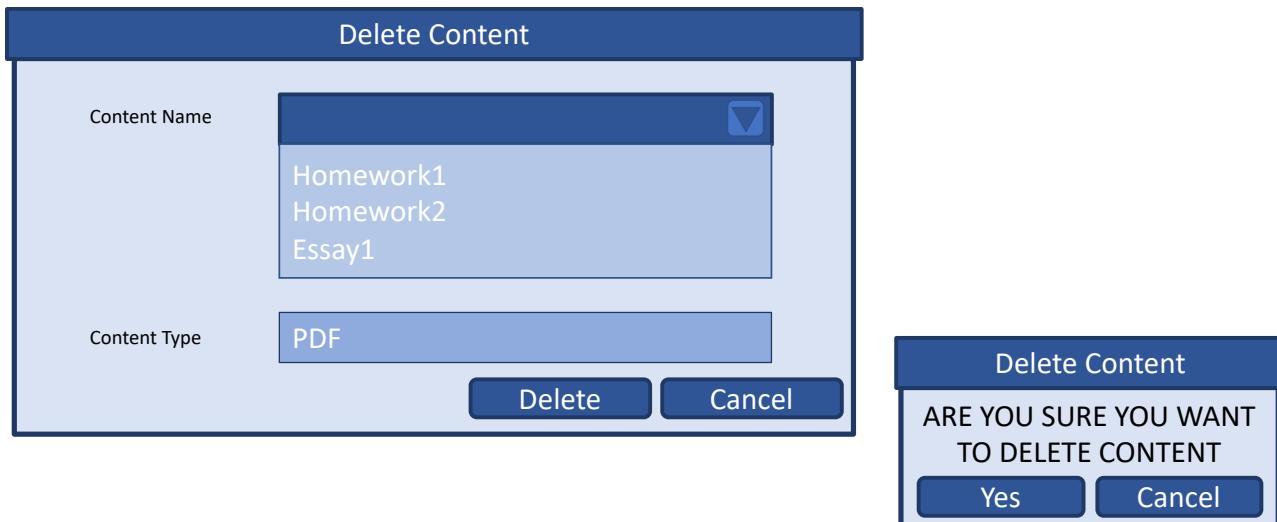
PDF

Delete **Cancel**

Delete Content

ARE YOU SURE YOU WANT TO DELETE CONTENT

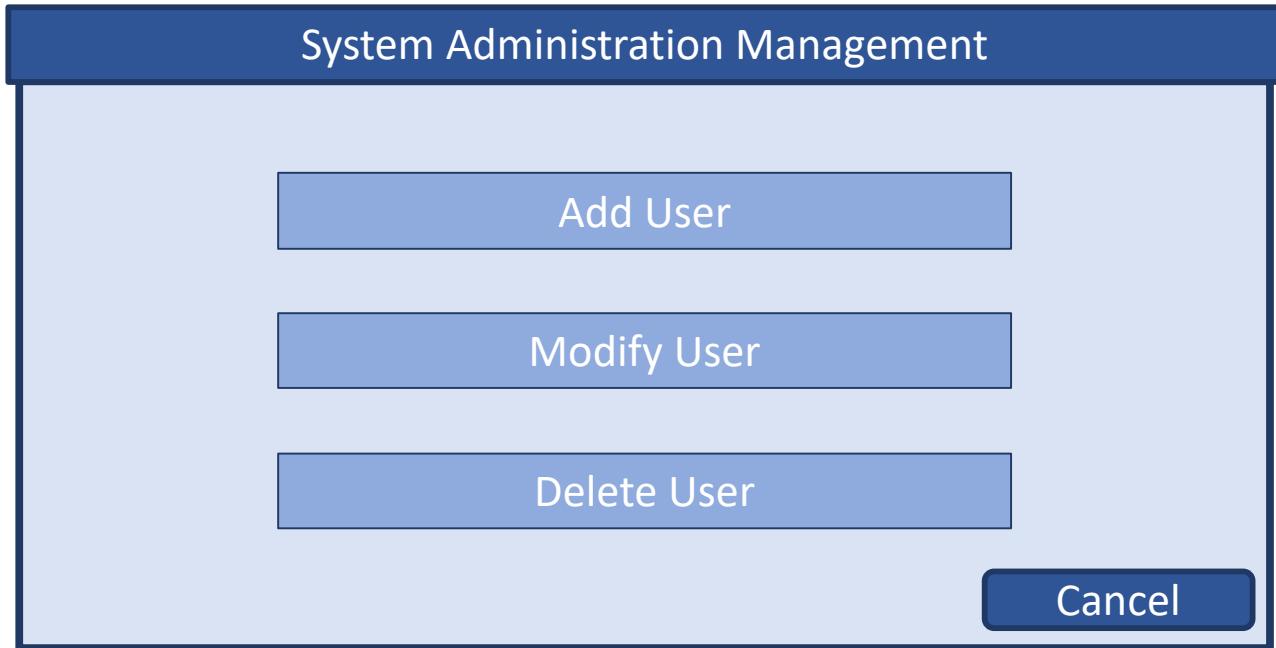
Yes **Cancel**



ContentManagementGUI – Delete Content

The ContentManagementGUI may allow the user to delete content by selecting ‘Delete’. The confirmation message allows the user to confirm content deletion by selecting ‘Yes’.

System Administration Management:



MainGUI – System Administration Management

The System Administration Management MainGUI allows the user to select whether to add, modify, or delete a user. It redirects to the SAMGUI.

The SAMGUI window has a dark blue header bar with the title "Add User". The main area contains four input fields: "Username" (pauljones), "Password" (pa\$4W0rd), "Email Address" (pauljones@email.arizona.edu), and "Authorization" (a dropdown menu showing "Student" and "Instructor"). At the bottom are two dark blue buttons labeled "Submit" and "Cancel".

SAMGUI – Add User

The SAMGUI may allow the user to add a user by entering a username, password, email address, and selecting an authorization level.

Modify User

Username	<input type="text" value="pauljones edenhazard kaihavertz"/>
Password	<input type="text" value="pa\$4W0rd"/>
Email Address	<input type="text" value="pauljones@email.arizona.edu"/>
Authorization	<input type="text" value="Student Instructor"/>
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

SAMGUI – Modify User

The SAMGUI may allow the user to modify a user by selecting a username and modifying the username, password, email address, and selecting an authorization level.

Delete User

Username	<input type="text" value="pauljones edenhazard kaihavertz"/>
Password	<input type="text" value="pa\$4W0rd"/>
Email Address	<input type="text" value="pauljones@email.arizona.edu"/>
Authorization	<input type="text" value="Instructor"/>
<input type="button" value="Delete"/> <input type="button" value="Cancel"/>	

Delete User

ARE YOU SURE YOU WANT
TO DELETE USER

SAMGUI – Delete User

The SAMGUI may allow the user to delete content by selecting ‘Delete’. The confirmation message allows the user to confirm content deletion by selecting ‘Yes’.

Gradebook Management:

Gradebook Management

Add Gradebook Item 

Modify Gradebook Item 

Delete Gradebook Item 

View Grades

Modify Grade 

Cancel

MainGUI – Gradebook Management

The Gradebook Management MainGUI allows the user to select whether to add, modify, or delete a user as well as view grades or modify a grade. It redirects to the GradebookGUI or GradeGUI.

Add Gradebook Item

Name:

Total Points:

Type:
Test
Quiz
Midterm

GradebookGUI – Add Gradebook Item

The GradebookGUI may allow the user to add a gradebook item by entering a name, total points, and gradebook type.

Modify Gradebook Item

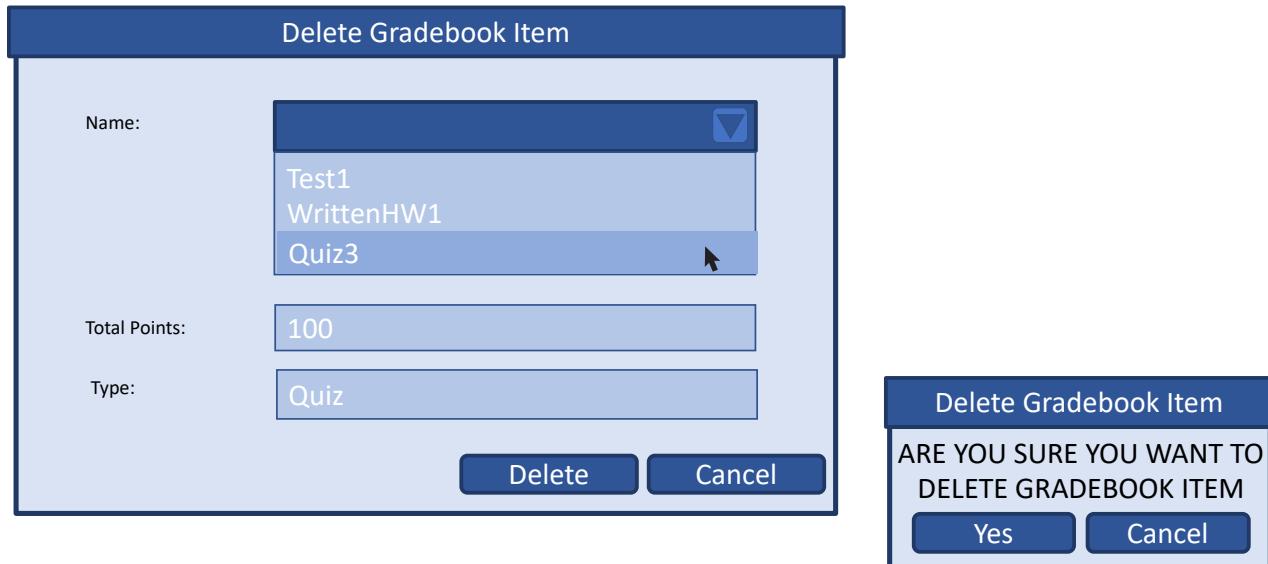
Name:
WrittenHW3
Test1
Test2

Total Points:

Type:
Test
Quiz
Midterm

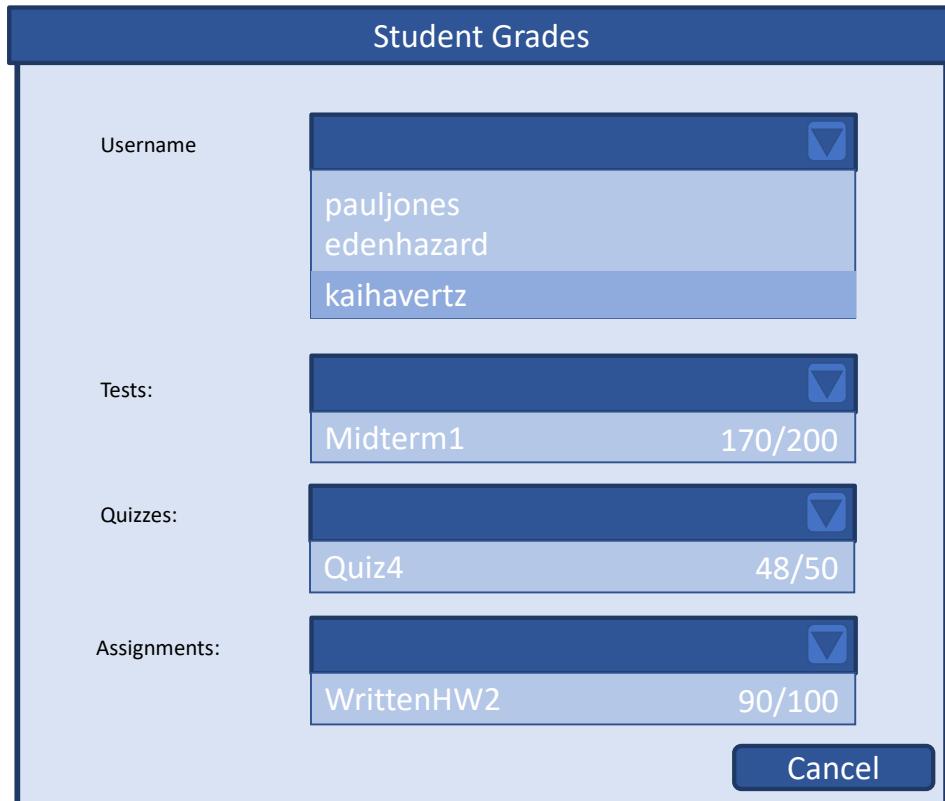
GradebookGUI – Modify Gradebook Item

The GradebookGUI may allow the user to modify a gradebook item by selecting a gradebook item name and entering a new name, total points, and gradebook type.



GradebookGUI – Delete Gradebook Item

The GradebookGUI may allow the user to delete content by selecting ‘Delete’. The confirmation message allows the user to confirm content deletion by selecting ‘Yes’.



GradeGUI – View Grades

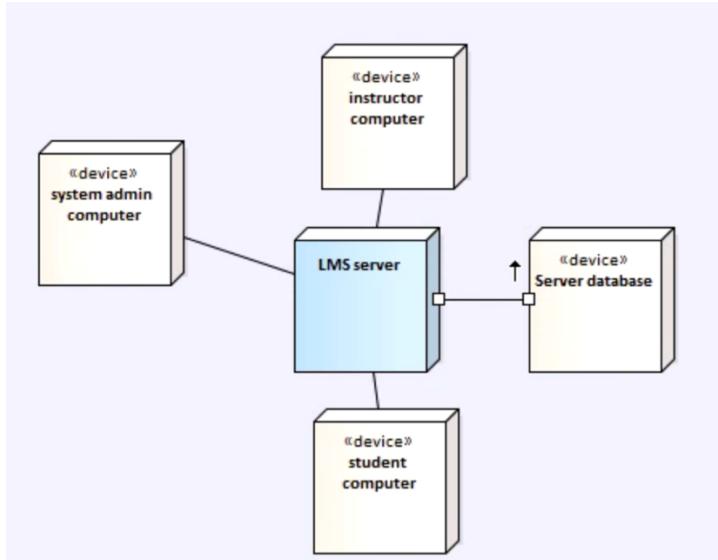
The GradeGUI may allow the user to select a username to view a user’s gradebook items’ grades.

Modify Student Grade

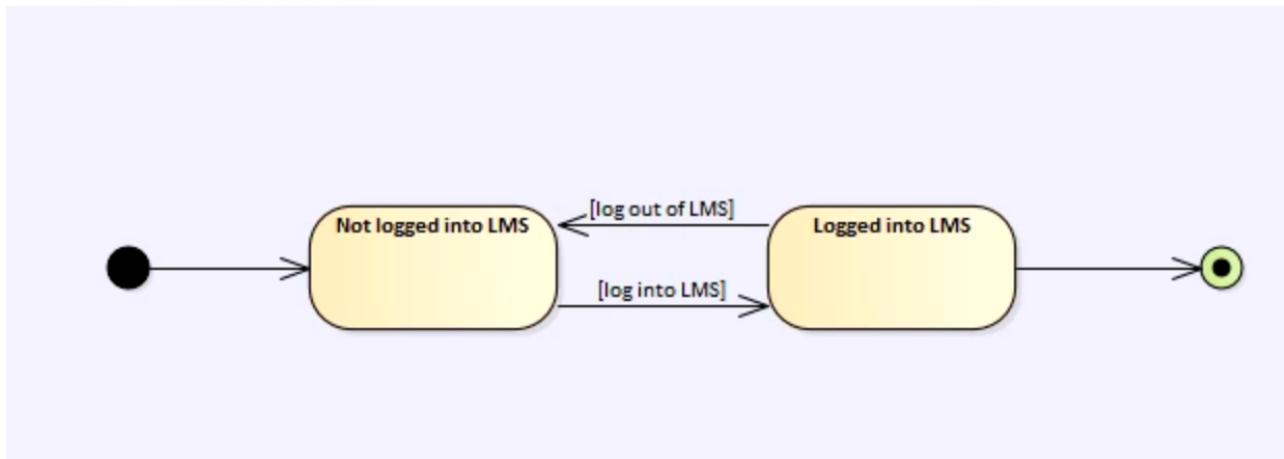
Username:	<input style="width: 100%; height: 100%;" type="text" value="pauljones"/> edenhazard
Tests:	<input style="width: 100%; height: 100%;" type="text" value="Midterm1"/> /200
Quizzes:	<input style="width: 100%; height: 100%;" type="text" value="Quiz4"/> 40/50
Assignments:	<input style="width: 100%; height: 100%;" type="text" value="WrittenHW2"/> 92/100
<input style="margin-right: 10px;" type="button" value="Submit"/> <input type="button" value="Cancel"/>	

GradeGUI – Modify Grade

The GradeGUI may allow the user to select a username to enter or modify a user's gradebook item grade.



This deployment diagram shows how LMS server connects to the different users computers and the servers database.



This state machine diagram shows how a user logs into the system.

Appendix A: Glossary

- LMS – Learning Management System
- CM- Content Management
- GM – Gradebook Management
- SAM – System Administration Management
- SCRD – System Combined Requirements & Design
- GUI – Graphical User Interface
- PR- Performance Requirement
- SAR – Safety Requirement
- SER – Security Requirement
- SQ – Software Quality Attributes
- FR – Functional Requirement
- SIE – Systems and Industrial Engineering

Appendix B: Requirements and Use Case Traceability Matrix

Use Case Traceability Matrix: