Software Requirements Specification for Student Management System

Version 1

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Syracuse University CSE687

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1	April 8, 2024		Group 15	All	Initial Revision

1. Introduction

1.1. Purpose

This Software Requirements Specification (SRS) aims to outline the software requirements for the Student Management System. It serves as a roadmap for developers to implement the necessary functionalities and for the test team to devise comprehensive Verification and Validation (V&V) plans and procedures. These efforts are directed towards ensuring that the system aligns with the specifications laid out herein, ultimately demonstrating its adherence to the intended functionality to the stakeholders.

1.2. Scope

This document specifies the requirements for the following capabilities.

The scope of the project encompasses the development of a Student Management System that includes functionalities for students, teachers, and administrators. For students, the system allows for grade inquiry, viewing course information, accessing courseware, and managing personal information. Teachers can use the system to release assignments and exams, upload course materials, manage grades, and handle personal and course-related information. Administrators have access to comprehensive information management tools for querying, modifying, and deletin g user and course data. The system focuses on providing a user-friendly interface, efficient management tools, and real-time access to information to improve the overall educational experience.

1.3. Definitions

BDD	Block Definition Diagram
SRS	Software Requirements Specification
UML	Unified Modeling Language

1.4. References

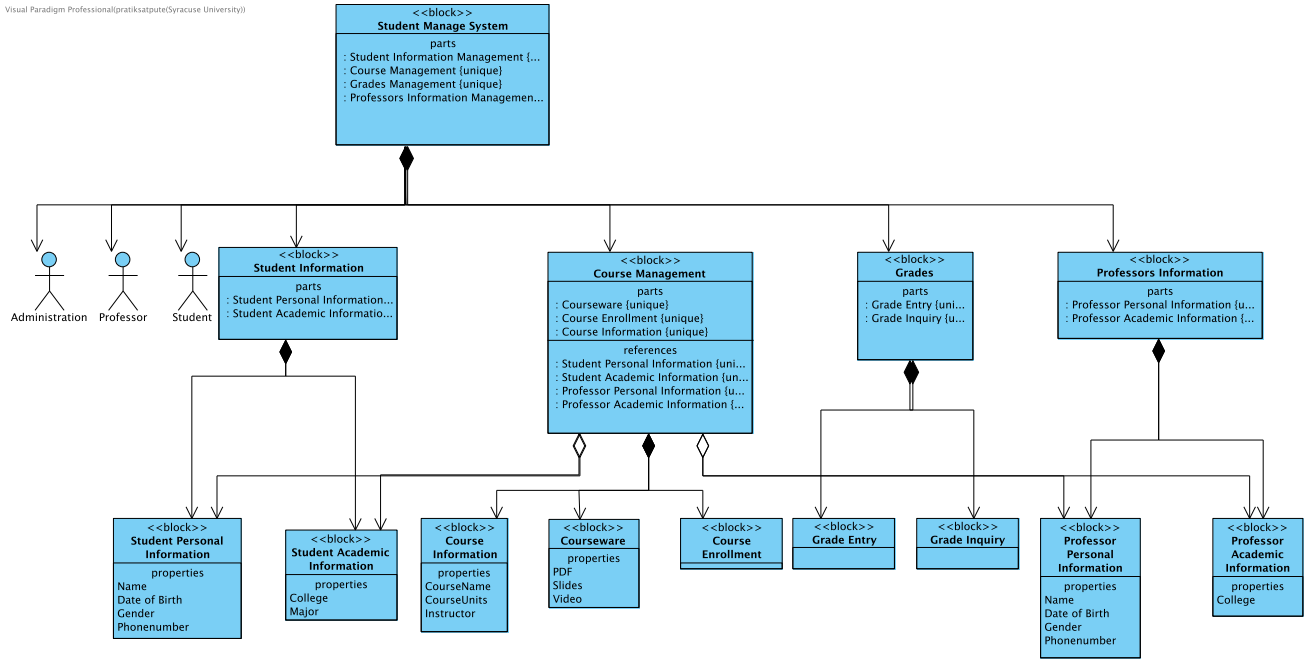
1. IEEE Std 830-1998 - IEEE Recommended Practice for Software Requirements Specifications - Revision of IEEE Std 830-1993

2. Overall Description

2.1. Product Perspective

This product will allow educational institutions to streamline the process of managing student-related activities. The primary purpose of this product is to facilitate the enrollment and management of courses based on student needs and academic offerings. A secondary purpose is to provide a system for managing student grades and professor assignments. This will be a software-intensive system, relying heavily on a user-friendly interface for students and professors, as well as robust database systems to maintain academic records.. Figure 1 System Block Diagram shows the system overview, using a UnifiedModeling Language (UML) Block Definition Diagram (BDD).

2.1.1. SMS Block Definition Diagram



2.1.1.1. Course Enrollment

This block manages the enrollment process, linking students to their chosen courses and maintaining records of their course selections.

2.1.1.2. Courseware

This part of Course Management handles educational materials and resources in various formats such as PDFs, slides, and videos, providing students and professors with the necessary tools for teaching and learning.

2.1.1.3. Course Information

This block manages essential details of courses like course name, units, and instructor information, providing a comprehensive profile for each course offered.

2.1.1.4. Course Management

This block is designed to handle all aspects related to courses within the SMS. It manages courseware, enrollment, and detailed course information.

2.1.1.5. Grade Entry

This block is responsible for the input and recording of student grades by professors.

2.1.1.6. Grade Inquiry

A complementary block to Grade Entry, allowing students and professors to query and review grades that have been recorded in the system.

2.1.1.7. Grades Management

The Grades Management block is focused on handling all functionalities related to the grading of students. It includes parts for grade entry and inquiries, providing a structured way to record and access grades.

2.1.1.8. Professor Academic Information

This manages academic-related details of professors such as their departments, research interests, and course associations.

2.1.1.9. Professor Personal Information

A sub-block under Professors Information Management, containing personal data of professors, akin to the Student Personal Information block but tailored to faculty needs.

2.1.1.10. Professors Information Management

This block manages all data pertaining to professors, including their personal and academic information. It ensures that details relevant to professor profiles are properly maintained.

2.1.1.11. Student Academic Information

A sub-block of Student Information Management, focusing on the academic aspects of student profiles, including information about their college and major.

2.1.1.12. Student Information Management

This component of the SMS is responsible for maintaining all student-related data. It is divided into parts that handle personal details and academic records of students.

2.1.1.13. Student Manage System

This is the overarching system that manages the entirety of the student-related processes. It encompasses sub-systems for managing student information, courses, grades, and professor information.
It serves as the main interface for administration, professors, and students to interact with the system.

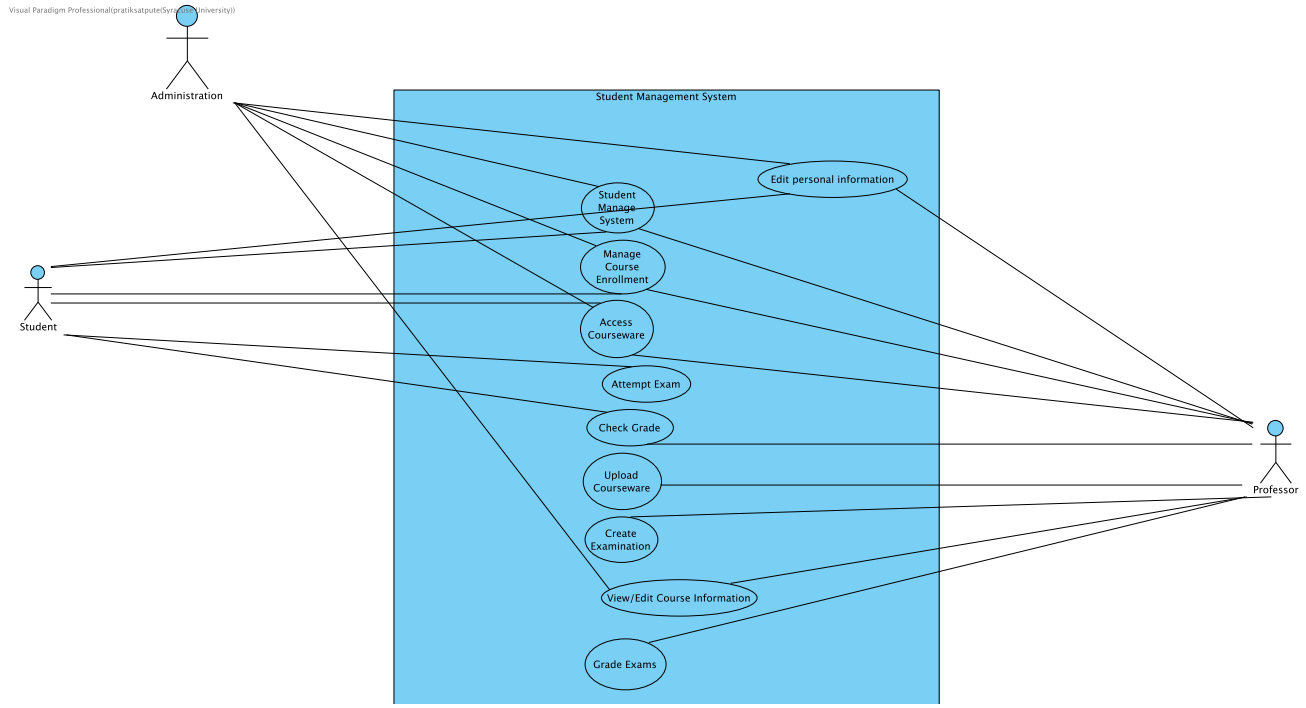
2.1.1.14. Student Personal Information

A sub-block of the Student Information Management system, this is dedicated to storing and managing personal data of students, such as names, birth dates, gender, and contact information.

2.2. Product Function

The following use case diagram depicts the users of the system, and the intended way in which they will interact with the system.

2.2.1. Student Management System Use Case Diagram



2.3. Use Case Descriptions

2.3.1. Administration

ID: AC03

The Administrator holds the primary responsibility for managing the personal information of all users in the student management system.The role of Administrator is to update or modify existing user information to ensure current and accurate records.

2.3.2. Professor

ID: AC02

The Professor is responsible for adding/editing course content, creating assessments/ assignments, grading assignments, tracking attendance, utilizing analytics for insights, collaborate with students.

2.3.3. Student

ID: AC05

In a Student Management System (SMS), the "Student" actor plays a central role, representing an individual enrolled in the educational institution that the system serves. This actor interacts with the SMS to perform a variety of tasks related to their academic journey,

personal information management, and engagement with institutional resources. Here's a detailed description of the "Student" actor:

Profile and Characteristics
Identity: A student is defined by their enrollment status at an educational institution. They have a unique identifier, such as a student ID, which is used to access the system and link them to their academic records, course enrollments, and personal data.

Demographics: The system stores demographic information about students, including name, age, gender, contact details, and emergency contacts, to personalize the user experience and facilitate communication.

Key Interactions with the SMS
Course Enrollment: Students use the SMS to browse available courses, register for classes, and manage their schedules each semester or term. This includes adding, dropping, or swapping courses within defined registration periods.

Academic Records: The actor accesses their academic records through the SMS, viewing grades. This enables self-tracking of academic achievements and planning for future semesters.

Personal Information Management: The actor has the ability to update personal information, such as address, phone number, and emergency contacts, ensuring that the institution has the most current information.

Learning Resources: Students access course materials, assignments, and grades through the SMS.

Expectations and Needs
Usability: Students expect the SMS to be intuitive and easy to navigate, allowing them to complete tasks efficiently without extensive training.

In summary, the "Student" actor is a vital user of the Student Management System, relying on its functionalities for a wide range of academic and administrative tasks. Their interactions with the system are foundational to their educational experience, necessitating a design that is user-centric, secure, and supportive of their academic goals.

2.3.4. Access Courseware

ID: UC03

This is the description of the "Access Courseware" feature.

2.3.4.1. Primary Actors

Administration, Professor, Student

2.3.4.2. Details

Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	Login successfullyAuthentication User needs to be enrolled into the course she is trying to accessValidate enrollment permissions and restrictions
Post-conditions	Sunny day-1: View content in it's correct format Rainy day-1: User tries to access restricted content
Author	N/A
Assumptions	N/A

2.3.4.3. Scenarios

2.3.4.3.1. Sunny Day

1. A student logs into the university's course management system, navigates to their course page, and clicks on the "Access Courseware" section. They find all the course materials neatly organized, including lecture notes, presentations, assignments, and readings. The files are in compatible formats, and the student can easily view or download them as needed. They quickly locate the materials they need for their upcoming assignment and proceed to study with ease.

2.3.4.3.2. Rainy Day

1. A student attempts to access course materials but encounters technical difficulties with the "Access Courseware" feature. They click on the section but receive an error message indicating that the files cannot be accessed at the moment. The student tries refreshing the page and logging in again, but the issue persists. Frustrated, they reach out to the university's technical support for assistance. It turns out there's a server outage causing the problem, and the IT team is working to resolve it as quickly as possible. In the meantime, the student is advised to check back later or seek alternative resources for their studies.

2.3.4.4. Requirements

2.3.4.4.1. Course Material Accessibility

ID: REQ027

Provide students with seamless access to course materials such as lecture notes, presentations, assignments, readings, and multimedia content with compatible file formats.

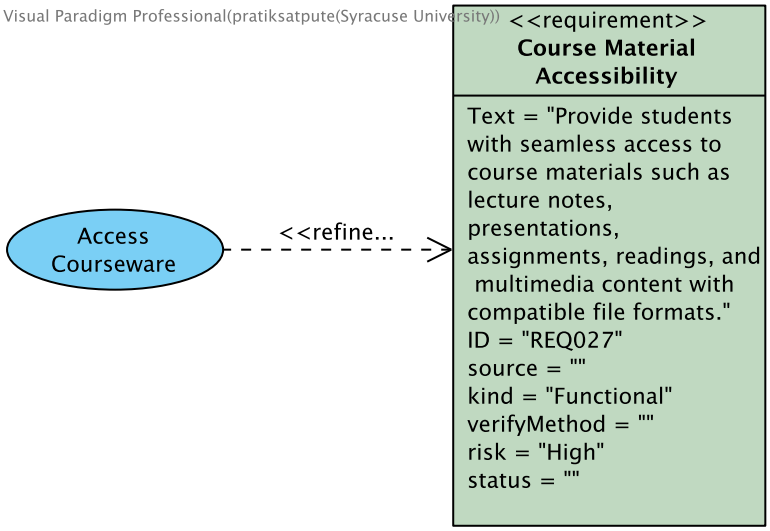
2.3.4.5. Relationships

Relationship	From	To
unnamed	Access Courseware	Course Material Accessibility

Relationship	From	To
unnamed	Access Courseware	Administration
unnamed	Student	Access Courseware
unnamed	Professor	Access Courseware

2.3.4.6. Reference Diagrams

2.3.4.6.1. Access Courseware Requirement Diagram



2.3.5. Edit personal information

ID: UC09

This use case enables users (students, professors, admins) to modify their personal information stored within the student management system. Personal information may include contact details, address, and other relevant data necessary for administrative and communication purposes.

2.3.5.1. Primary Actors

Administration, Professor, Student

2.3.5.2. Details

Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	The user must have appropriate authentication to access their profile settings and edit personal information.
Post-conditions	Personal information updates are successfully saved in the system, ensuring data accuracy and integrity.
Author	N/A

Assumptions N/A

2.3.5.3. Scenarios

2.3.5.3.1. Sunny Day

1. The user securely logs into the system using their credentials without any delays.
2. They smoothly navigate to their profile settings section.
3. Utilizing the intuitive interface, the user edits their personal information accurately and efficiently.
4. Upon completing the edits, they save the changes without encountering any issues.
5. The system promptly updates the personal information, ensuring data integrity and accuracy.
6. The user receives a confirmation message indicating successful updating of their personal information.
7. The entire process is executed seamlessly, without any system errors or user confusion.

2.3.5.3.2. Rainy Day

1. The user experiences slow response times upon attempting to log into the system, possibly due to server congestion.
2. Despite multiple attempts, they encounter difficulties accessing their profile settings due to intermittent system errors.
3. When finally able to access their profile, the user faces challenges editing their personal information as the system interm ittently freezes.
4. After prolonged efforts, they manage to save the changes, but the system fails to update the personal information due to a database error.
5. Frustrated, the user tries to reach out for support, but encounters difficulties as the system's help features are unrespons ive.
6. The user is unable to confirm whether their personal information has been successfully updated, leading to uncertainty and frustration.
7. The overall process is marred by system glitches and delays, causing inconvenience and dissatisfaction for the user.

2.3.5.4. Use Case Notes

2.3.5.4.1. Use Case Note

■ Workflow
• *Users (students, professors, admins) access their profile settings, make necessary changes to personal information (e. g., contact details, address), and save the updates.*
■ Business Logic
• *Users should only be able to edit their own personal information. Admins have the authority to edit personal informatio n for any user.*
•
■ Decisions
• *The system will log all changes made to personal information for audit purposes.*
•
■ Follow-up
• *Regularly review and update the audit logs for personal information changes.*
•

2.3.5.5. Requirements

2.3.5.5.1. Access Personal Information

ID: REQ045
Users (students, professors, admins) will have access to their respective personal information for editing. Admins will be able to access and edit personal information for any user within the system.

2.3.5.5.2. Data Validation

ID: REQ046
System will validate edited personal information to ensure it meets specified format and criteria. Error messages will be displayed for any invalid data entries, prompting users to correct them.

2.3.5.5.3. User Authentication

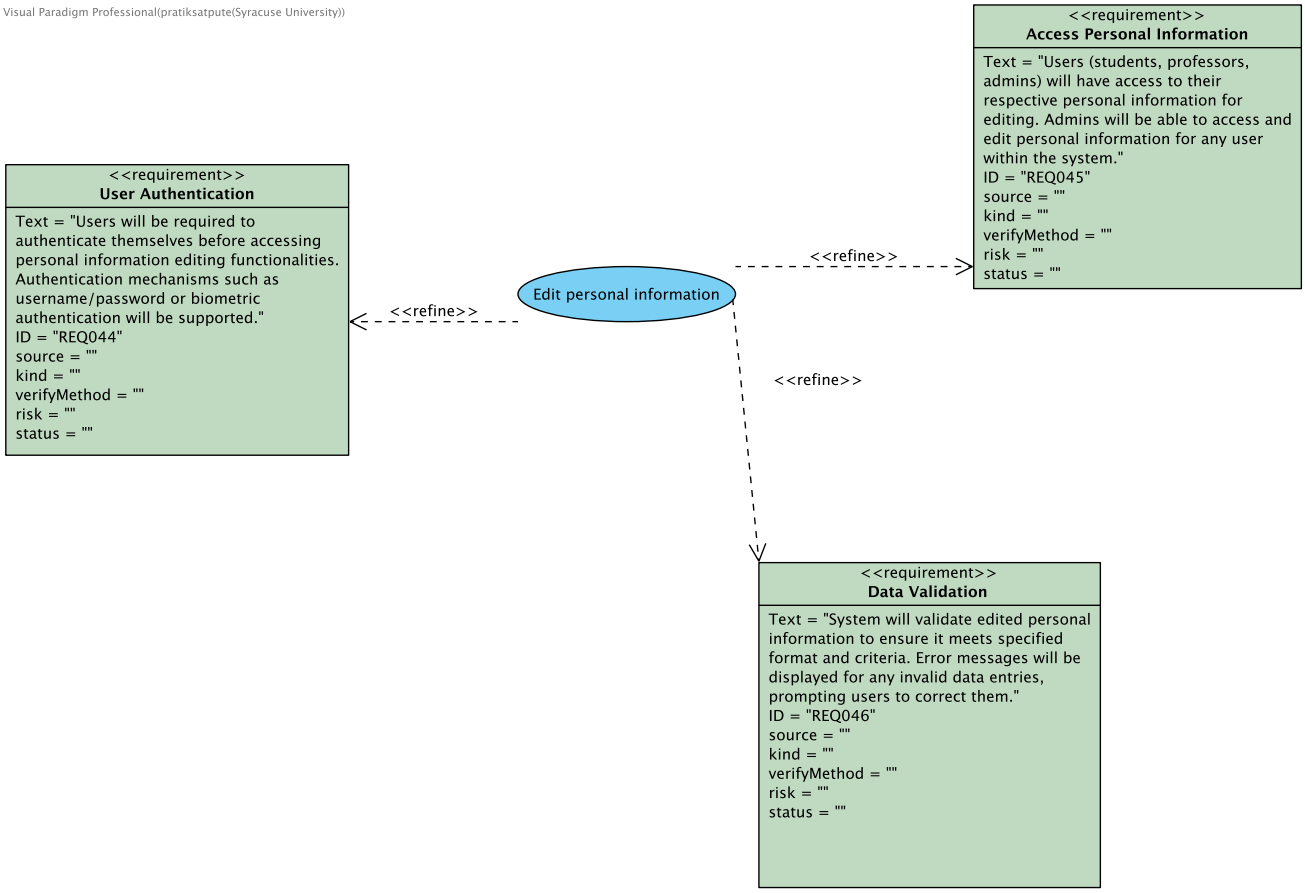
ID: REQ044
Users will be required to authenticate themselves before accessing personal information editing functionalities. Authentication mechanisms such as username/password or biometric authentication will be supported.

2.3.5.6. Relationships

Relationship	From	To
unnamed	Edit personal information	User Authentication
unnamed	Edit personal information	Access Personal Information
unnamed	Edit personal information	Data Validation
unnamed	Edit personal information	Administration
unnamed	Professor	Edit personal information
unnamed	Student	Edit personal information

2.3.5.7. Reference Diagrams

2.3.5.7.1. Edit Personal Information Requirement Diagram



2.3.6. Manage Course Enrollment

ID: UC02

This is the description for the Manage Course Enrollment use case

2.3.6.1. Primary Actors

Administration, Professor, Student

2.3.6.2. Details

Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	User is logged into the system Authentication
Post-conditions	Sunny day-1: User is able to opt into the course of their choice based on their preferences if they meet the pre-requisites to do do. Rainy day-1: User tries to opt-into a course when they haven't taken pre-requisites
Author	N/A
Assumptions	N/A

2.3.6.3. Scenarios

2.3.6.3.1. Sunny day 1

1. The Scenario begins when the display is showing function options, and the students has decided which function they want to use now.
2. The students choose to enquire their course information.
3. The display prompts students to choose which course they want to enquiry.
4. The students choose the course they want to enquire.
5. The display shows the detail information of this course.

2.3.6.3.2. Rainy day 1

1. The Scenario begins when the display is showing function options, and the students has decided which function they want to use now.
2. The students choose to enquire their course information.
3. The display prompts students to choose which course they want to enquire.
4. The students choose the course they want to enquire.
5. The display shows an error because the student is not enrolled in the course.

2.3.6.3.3. Rainy day 2

1. The Scenario begins when the display is showing function options, and the students has decided which function they want to use now.
2. The students choose to enquire their course information.
3. The display prompts students to choose which course they want to enquire.
4. The students choose the course they want to enquire.
5. The display shows an error because information has not been announced.

2.3.6.4. Requirements

2.3.6.4.1. Integration with Student Information System

ID: REQ025
Integrate with the university's Student Information System synchronize enrollment data, course catalog information, student records, and other relevant data

2.3.6.4.2. Validate enrollment permissions and restrictions

ID: REQ026
Define enrollment limits, setting prerequisites, enforcing class restrictions.

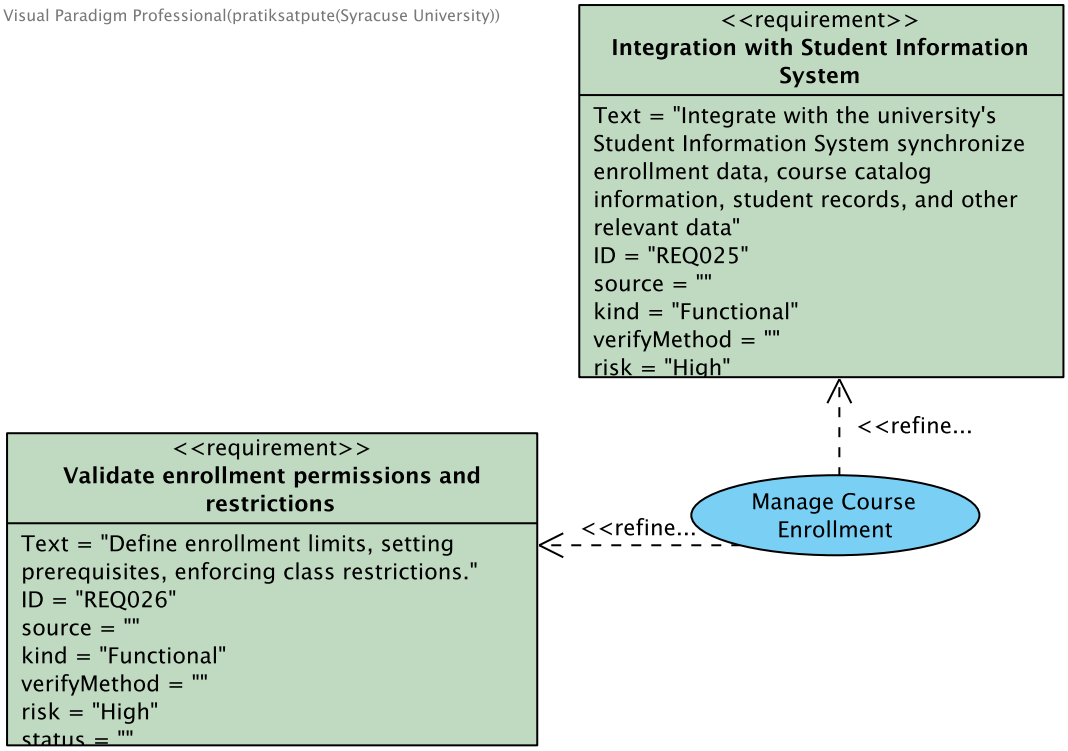
2.3.6.5. Relationships

Relationship	From	To
«r» unnamed	Manage Course Enrollment	Validate enrollment permissions and restrictions
«r» unnamed	Manage Course Enrollment	Integration with Student Information System
unnamed	Manage Course Enrollment	Administration
unnamed	Student	Manage Course Enrollment

Relationship	From	To
unnamed	Professor	Manage Course Enrollment

2.3.6.6. Reference Diagrams

2.3.6.6.1. Manage Course Enrollment Requirement Diagram



2.3.7. Student Manage System

ID: UC04

This is the detailed description of the Login page

2.3.7.1. Primary Actors

Administration, Professor, Student

2.3.7.2. Details

Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	User is on the student database
Post-conditions	Sunny-day-1: User is given access to the student side of the application Rainy-day-1: User fails to authenticate and taken back to the login screen
Author	N/A
Assumptions	N/A

2.3.7.3. Scenarios

2.3.7.3.1. Sunny Day

1. A user navigates to the login page, enters their username and password correctly, and clicks the login button. The credentials are authenticated successfully, and the user is redirected to their dashboard or the main page of the application, where they can access all the features and functionalities available to them.

2.3.7.3.2. Rainy Day

1. A user attempts to login but enters an incorrect username or password. Upon clicking the login button, the system detects the error and displays a message indicating that the credentials are invalid. The user is prompted to re-enter their username and password or reset their password if they've forgotten it. If the issue persists due to multiple failed attempts or other technical issues, the user may be advised to contact support for assistance in resolving the login problem.

2.3.7.4. Requirements

2.3.7.4.1. Authentication

ID: REQ009

Validate user-provided credentials, such as username and password, against stored data (like a database) to authenticate and grant access to the application securely.

2.3.7.4.2. Error Handling

ID: REQ011

Implement robust error handling mechanisms to detect and gracefully manage various error scenarios, such as incorrect login credentials, server-side failures, or session expiration. Provide clear and informative error messages to guide users in troubleshooting login issues effectively.

2.3.7.4.3. Session Management

ID: REQ010

Create and manage unique sessions for authenticated users, enabling seamless access to restricted areas of the application without frequent reauthentication. This involves securely storing session data and handling session expiration or invalidation.

2.3.7.5. Relationships

Relationship	From	To
«r» unnamed	Student Manage System	Authentication
«r» unnamed	Student Manage System	Session Management
«r» unnamed	Student Manage System	Error Handling
«r» unnamed	Student Manage System	Log in to System
«r» unnamed	Student Manage System	Password Verification
«r» unnamed	Student Manage System	Selecting a User Type
«r» unnamed	Student Manage System	Error Feedback
«r» unnamed	Student Manage System	Intuitive User Interface
«r» unnamed	Student Manage System	System responsiveness
«r» unnamed	Student Manage System	Security of User Data

Relationship	From	To
unnamed	Student Manage System	Accessibility
unnamed	Student Manage System	Capacity
unnamed	Student Manage System	Data Encryption
unnamed	Student Manage System	Information Assurance
unnamed	Student Manage System	Software Quality
unnamed	Student Manage System	Administration
unnamed	Student	Student Manage System
unnamed	Professor	Student Manage System

2.3.7.6. Reference Diagrams

2.3.8. View/Edit Course Information

ID: UC08

The "Edit Course Information" feature in a Student Management System focuses on key areas to ensure efficient course management. Access Control guarantees that only authorized users can make changes, safeguarding the integrity of course data. Course Selection allows for easy identification and selection of courses through a search functionality. Information Editing enables modifications to essential details like course name, description, and credits. Finally, Schedule Adjustments facilitate the updating of lecture times and locations. This streamlined approach ensures that course information is accurately maintained and readily adjustable to meet the evolving needs of the institution.

2.3.8.1. Primary Actors

Administration, Professor

2.3.8.2. Details

Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	User Authentication: The user attempting to edit course information must be authenticated and recognized by the system as having the necessary permissions (as an administrator, faculty member, or staff). Student Manage System Course Selection: The specific course to be edited must have been identified and selected in the system. Access Courseware

	Data Availability: All relevant data fields that may need to be edited, such as course name, description, credits, and schedule, must be retrievable and editable.Editable Fields
Post-conditions	Information Updated: The course information is updated in the database with the new details as entered by the user.View/Edit Course Information Consistency Maintained: The updates are consistently reflected across all instances where the course information is accessed or displayed within the system.
Author	N/A
Assumptions	N/A

2.3.8.3. Scenarios

2.3.8.3.1. Sunny Day

1. The user logs into the Student Management System smoothly.
2. They proceed to the "View/Edit Course Information" section and quickly find the specific course using the system's efficient search capability.
3. Upon selecting the course, the user is presented with all the editable fields and accurately updates the course's lecture times, locations, and instructor assignment.
4. They then upload the new syllabus without any technical hitches, and the system accepts the document in the first attempt.
5. After reviewing all the modifications for accuracy, the user saves the changes. The system processes the updates instantly and displays a confirmation message.
6. The system reflects the new course information across all interfaces, and relevant stakeholders can view the latest details upon accessing the course in the system.

2.3.8.3.2. Rainy Day

1. The faculty member experiences a delay while logging into the Student Management System, possibly due to server issues.
2. When they reach the "View/Edit Course Information" section, the search feature is slow and requires several attempts to locate the desired course.
3. Once the course is found, the system intermittently hangs, causing frustration as the user tries to enter the new details for the course schedule and syllabus.
4. The faculty member tries to upload the updated syllabus file, but the system rejects it multiple times without providing a clear reason or error message.
5. Changes to the course information cannot be saved as the system times out, failing to process the request.
6. Without the confirmation of saved changes, the course information remains outdated, and students continue to access incorrect details, leading to potential misunderstandings about course schedules and content.

2.3.8.4. Requirements

2.3.8.4.1. Access Control

ID: REQ016

Ensure that only authorized personnel (e.g., administrators, faculty members) can edit course information.

2.3.8.4.2. Course Identification

ID: REQ012
Ability to search for and select a course by its code, name, or other identifiers.

2.3.8.4.3. Editable Fields

ID: REQ013
Enable editing of various course details, including name, description, credits, prerequisites, co-requisites, and associated departments or faculties.

2.3.8.4.4. Schedule Adjustments

ID: REQ014
Options to modify course schedules, including lecture times, locations, and the assignment of instructors.

2.3.8.4.5. Syllabus Upload and Edit

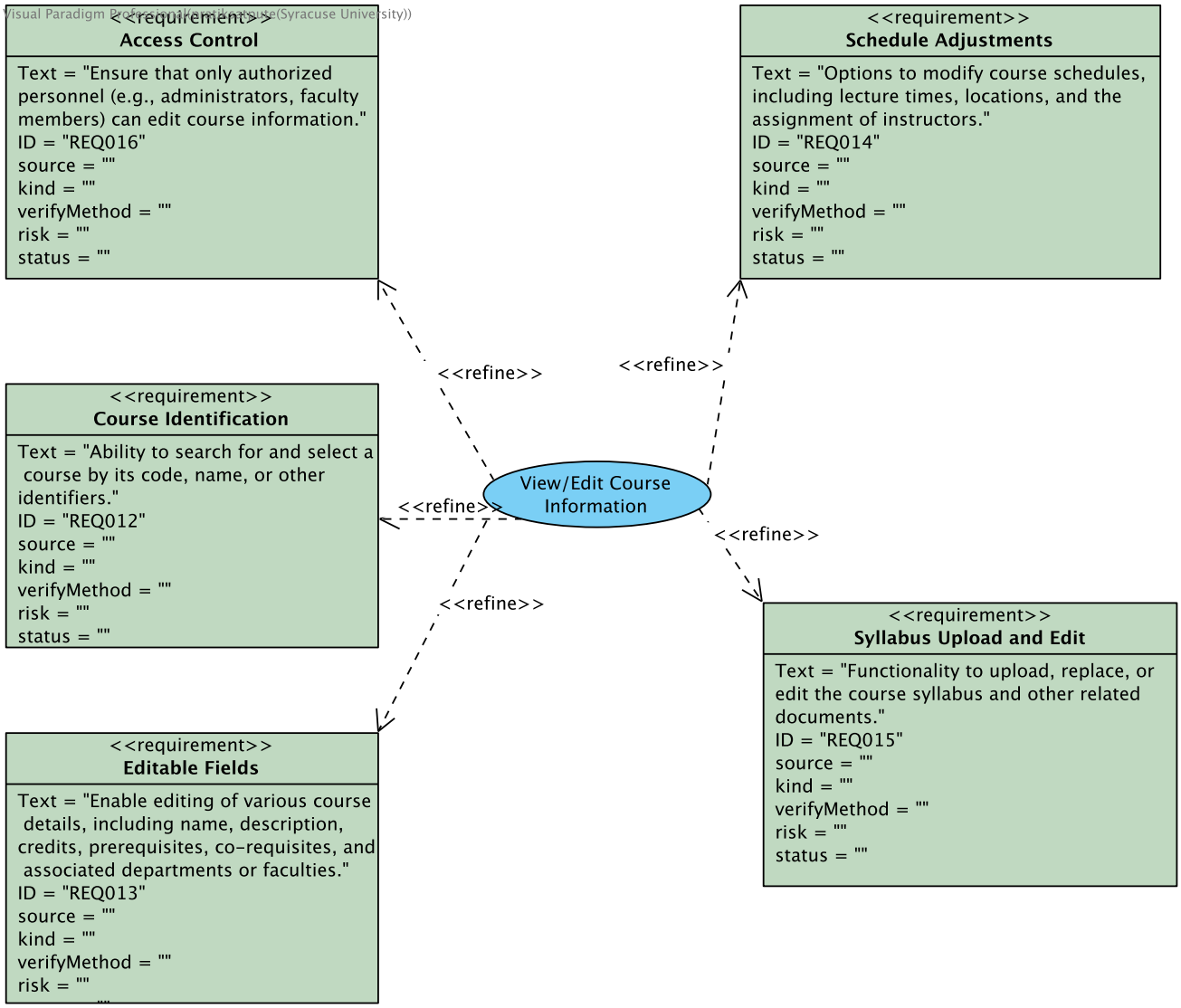
ID: REQ015
Functionality to upload, replace, or edit the course syllabus and other related documents.

2.3.8.5. Relationships

Relationship	From	To
«r» unnamed	View/Edit Course Information	Access Control
«r» unnamed	View/Edit Course Information	Course Identification
«r» unnamed	View/Edit Course Information	Editable Fields
«r» unnamed	View/Edit Course Information	Schedule Adjustments
«r» unnamed	View/Edit Course Information	Syllabus Upload and Edit
unnamed	View/Edit Course Information	Administration
unnamed	Professor	View/Edit Course Information

2.3.8.6. Reference Diagrams

2.3.8.6.1. View/Edit Course Information Requirement Diagram



2.4. User Characteristics

Refer to Use Case Diagram above and the descriptions of the Actors.

2.5. Constraints

These are defined specifically in Section 3

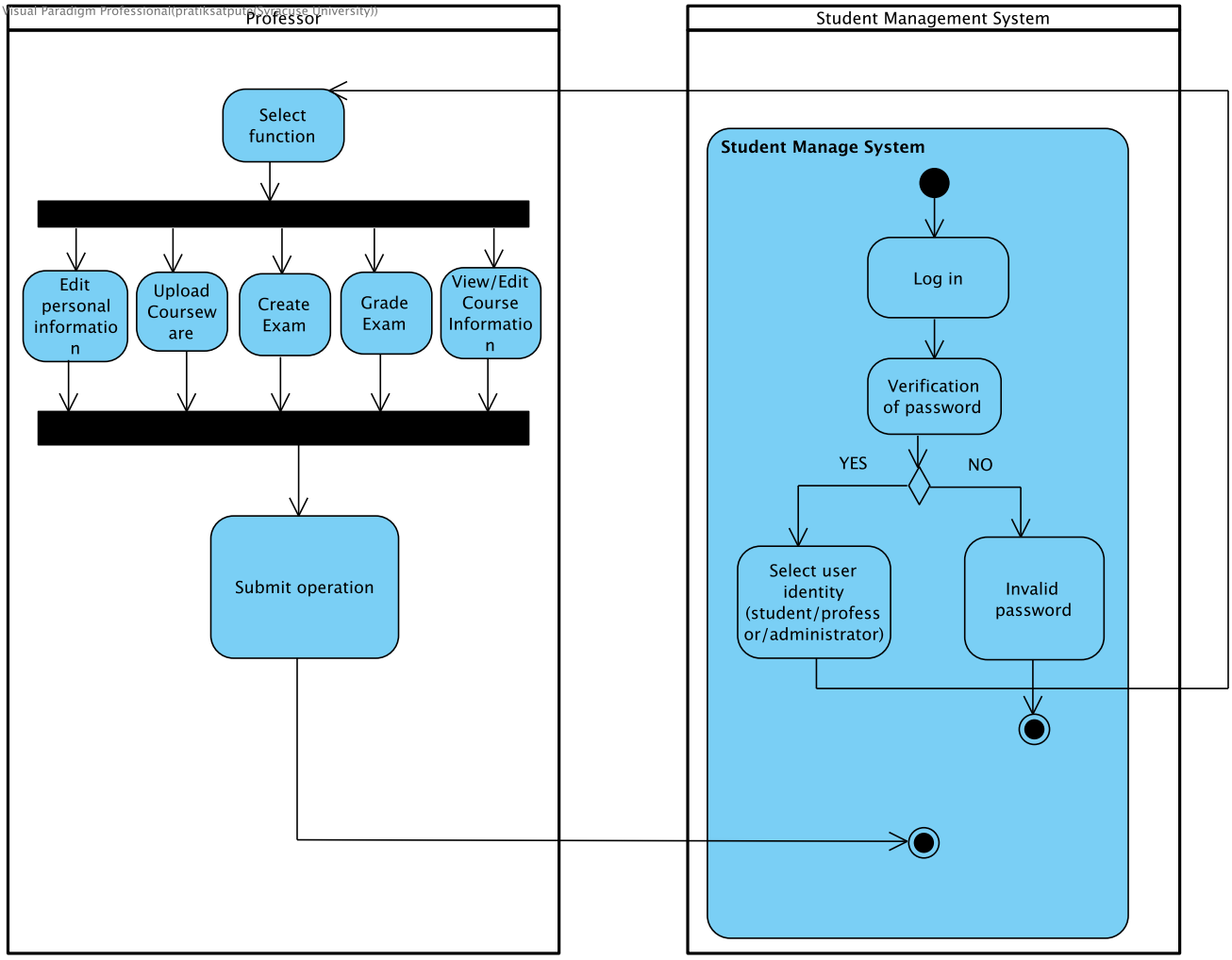
3. Specific Requirements

3.1. Overview

This product will enable educational institutions to significantly reduce the time and effort required to manage student affairs and academic

activities. This section provides the detailed features of the system and the associated requirements.

3.1.1. Professor Activity Diagram



3.1.1.1. Create Exam

Professors can access this function to review student responses, assign grades, and provide feedback on exam performance. Provides a streamlined interface for grading exams, with features such as question-by-question grading, rubric-based evaluation, and comment capabilities. Professors can view exam submissions, assess student responses, and assign grades based on established criteria and grading standards.

3.1.1.2. Edit personal information

Allows professors to update and manage their personal information within the student management system. Professors can access this function to modify details such as contact information, office hours,

academic credentials, and other relevant data. Provides a secure and user-friendly interface for professors to review and edit their personal details, ensuring accuracy and completeness of their records.

3.1.1.3. Grade Exam

3.1.1.4. Select function

3.1.1.5. Submit operation

3.1.1.6. Upload Courseware

Professors can access this function to share educational resources with students, ensuring timely and convenient access to course materials. Supports various file formats and provides options for organizing and categorizing uploaded content by course, topic, or date. Additionally, professors can set access permissions and release schedules for uploaded coursework, controlling when and how students can access the materials.

3.1.1.7. View/Edit Course Information

Professors can access this function to manage course offerings, update course descriptions, and communicate course expectations to students. Provides a centralized platform for professors to review course information, make changes as needed, and ensure accuracy and consistency across course offerings. Additionally, professors can use the function to publish course updates, announcements, and resources for student access.

3.1.1.8. Invalid password

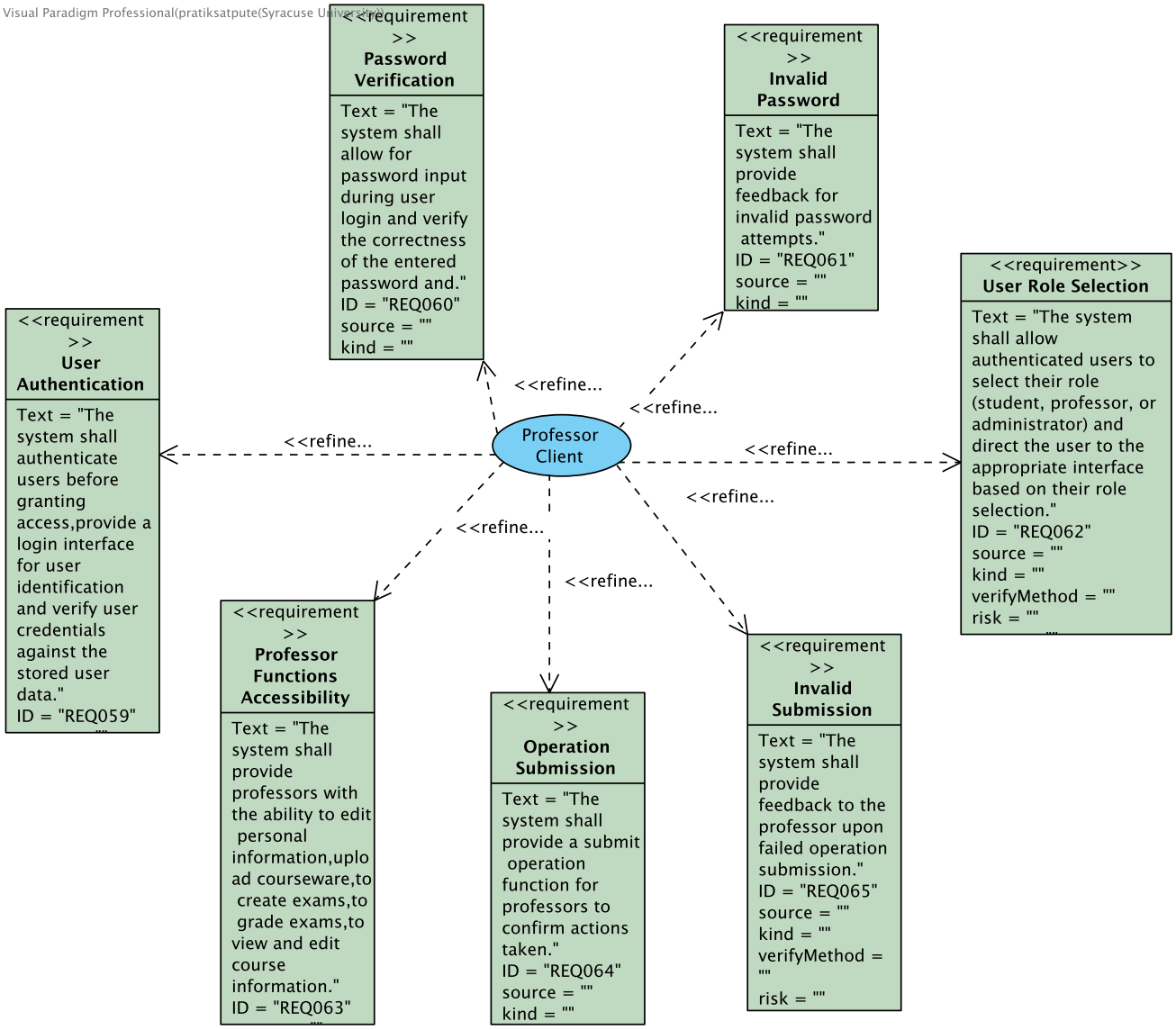
3.1.1.9. Log in

Allows users to securely access the student management system by providing their unique username and password.

3.1.1.10. Select user identity (student/professor/administrator)

3.1.1.11. Verification of password

3.1.1.12. Professor Client System Requirement Diagram



3.1.1.12.1. Password Verification

ID: REQ060

The system shall allow for password input during user login and verify the correctness of the entered password and.

3.1.1.12.2. Professor Functions Accessibility

ID: REQ063

The system shall provide professors with the ability to edit personal information,upload courseware,to create exams,to grade exams,to view and edit course information.

3.1.1.12.3. User Authentication

ID: REQ059

The system shall authenticate users before granting access,provide a login interface for user identification and verify user credentials against the stored user data.

3.1.1.12.4. Invalid Password

ID: REQ061

The system shall provide feedback for invalid password attempts.

3.1.1.12.5. Invalid Submission

ID: REQ065

The system shall provide feedback to the professor upon failed operation submission.

3.1.1.12.6. Operation Submission

ID: REQ064

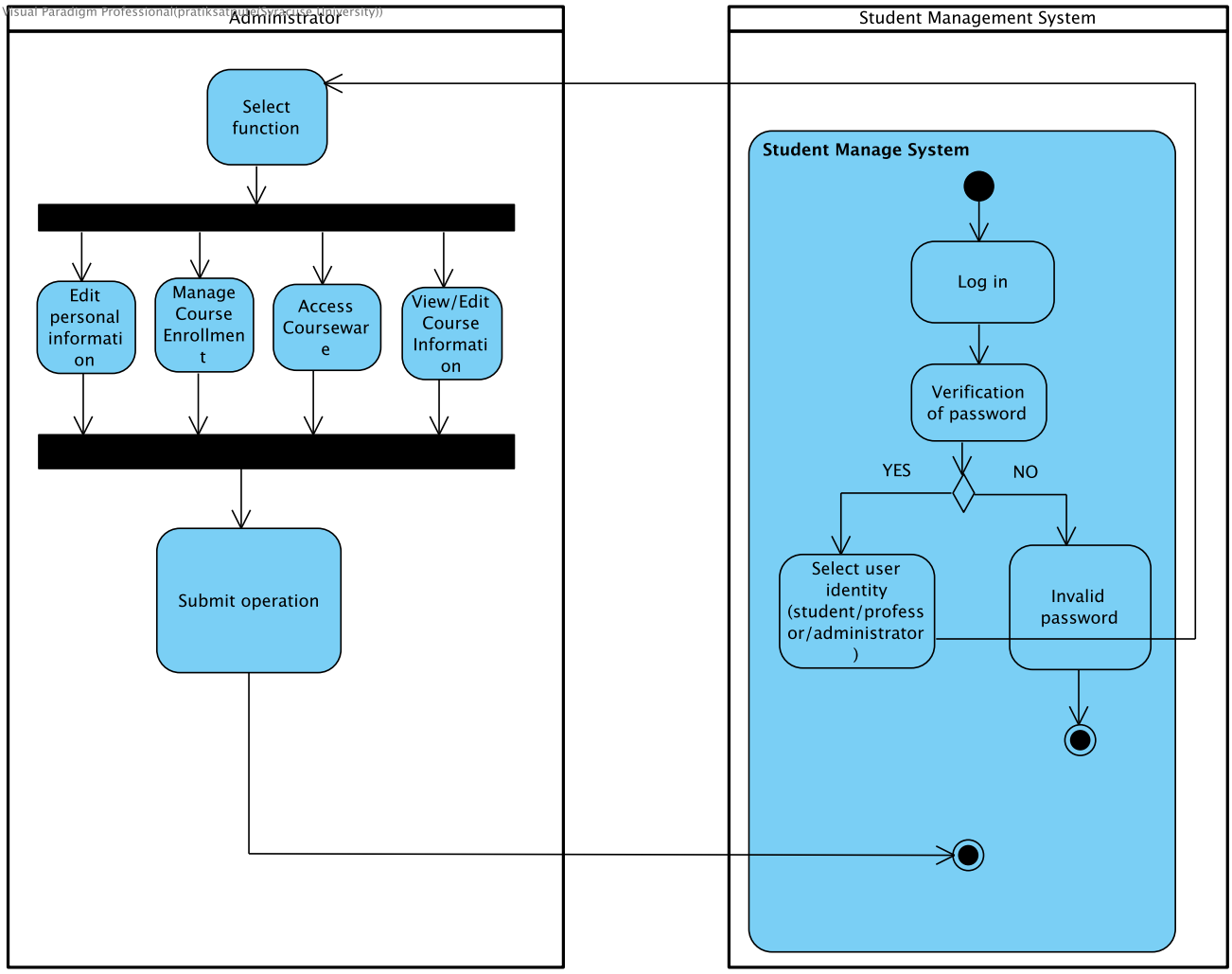
The system shall provide a submit operation function for professors to confirm actions taken.

3.1.1.12.7. User Role Selection

ID: REQ062

The system shall allow authenticated users to select their role (student, professor, or administrator) and direct the user to the appropriate interface based on their role selection.

3.1.2. Administrator Activity Diagram



3.1.2.1. Access Courseware

Provides administrators with a centralized platform to organize course materials, categorize content by course, department, or academic term, and set access permissions for users.

3.1.2.2. Edit personal information

3.1.2.3. Manage Course Enrollment

Monitor enrollment statistics, review enrollment requests, and ensure the smooth operation of course registration. Provides administrators with a comprehensive dashboard displaying real-time enrollment data, including course capacities, enrollment trends, and waitlist status. Enables admin user to review enrollment requests, approve or deny enrollment requests based on course availability and eligibility criteria, and manage waitlists for oversubscribed courses.

3.1.2.4. Select function

3.1.2.5. Submit operation

3.1.2.6. View/Edit Course Information

Administrators can access this function to share educational resources with students, faculty, and staff, ensuring timely access to course materials. Supports various file formats and provides options for organizing and categorizing uploaded content by course, department, or academic term. Additionally, administrators can set access permissions and release schedules for uploaded coursework, controlling when and how users can access the materials.

3.1.2.7. Invalid password

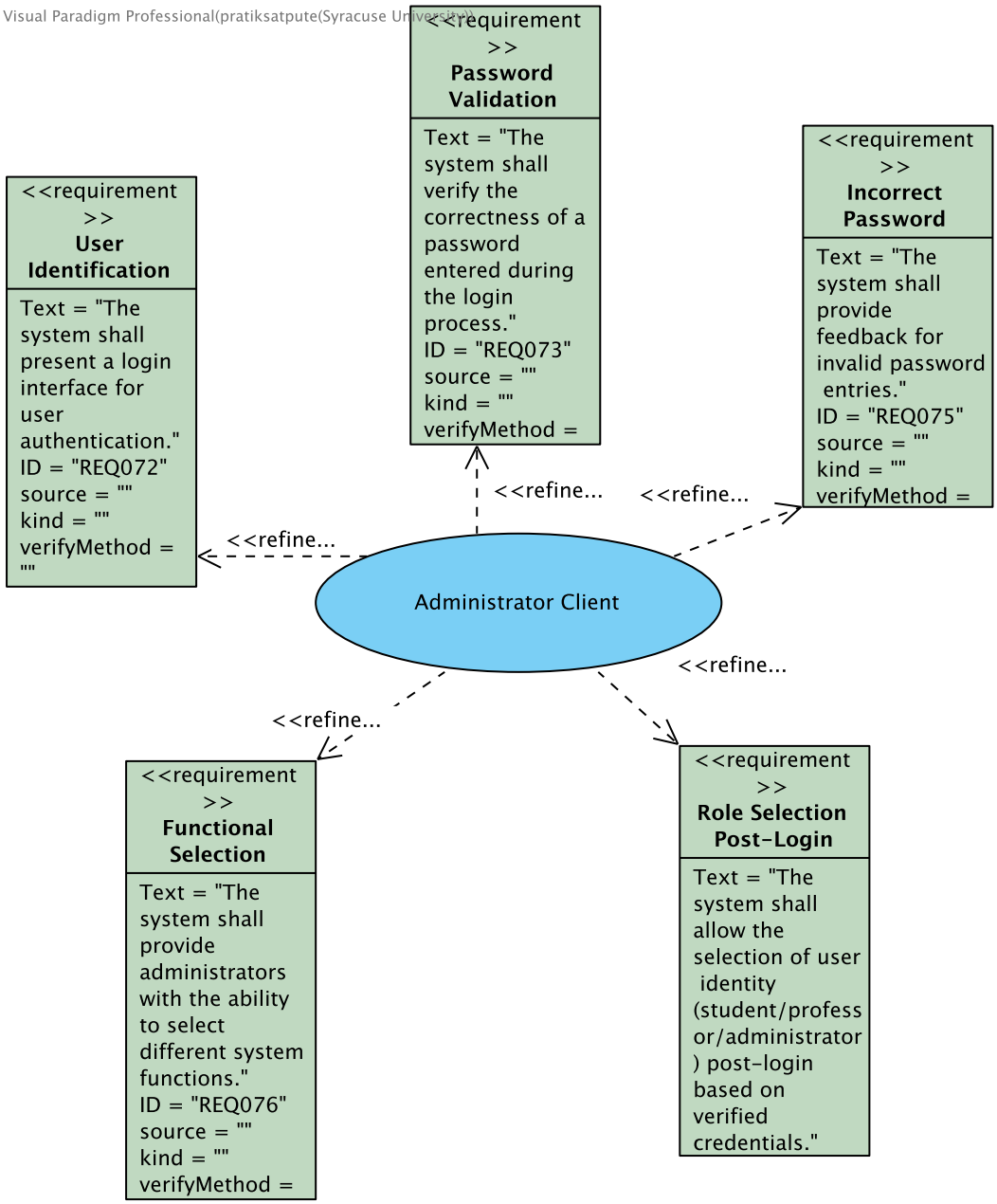
3.1.2.8. Log in

Allows users to securely access the student management system by providing their unique username and password.

3.1.2.9. Select user identity (student/professor/administrator)

3.1.2.10. Verification of password

3.1.2.11. Administrator Client System Requirement Diagram



3.1.2.11.1. Functional Selection

ID: REQ076

The system shall provide administrators with the ability to select different system functions.

3.1.2.11.2. Incorrect Password

ID: REQ075

The system shall provide feedback for invalid password entries.

3.1.2.11.3. Password Validation

ID: REQ073

The system shall verify the correctness of a password entered during the login process.

3.1.2.11.4. Role Selection Post-Login

ID: REQ074

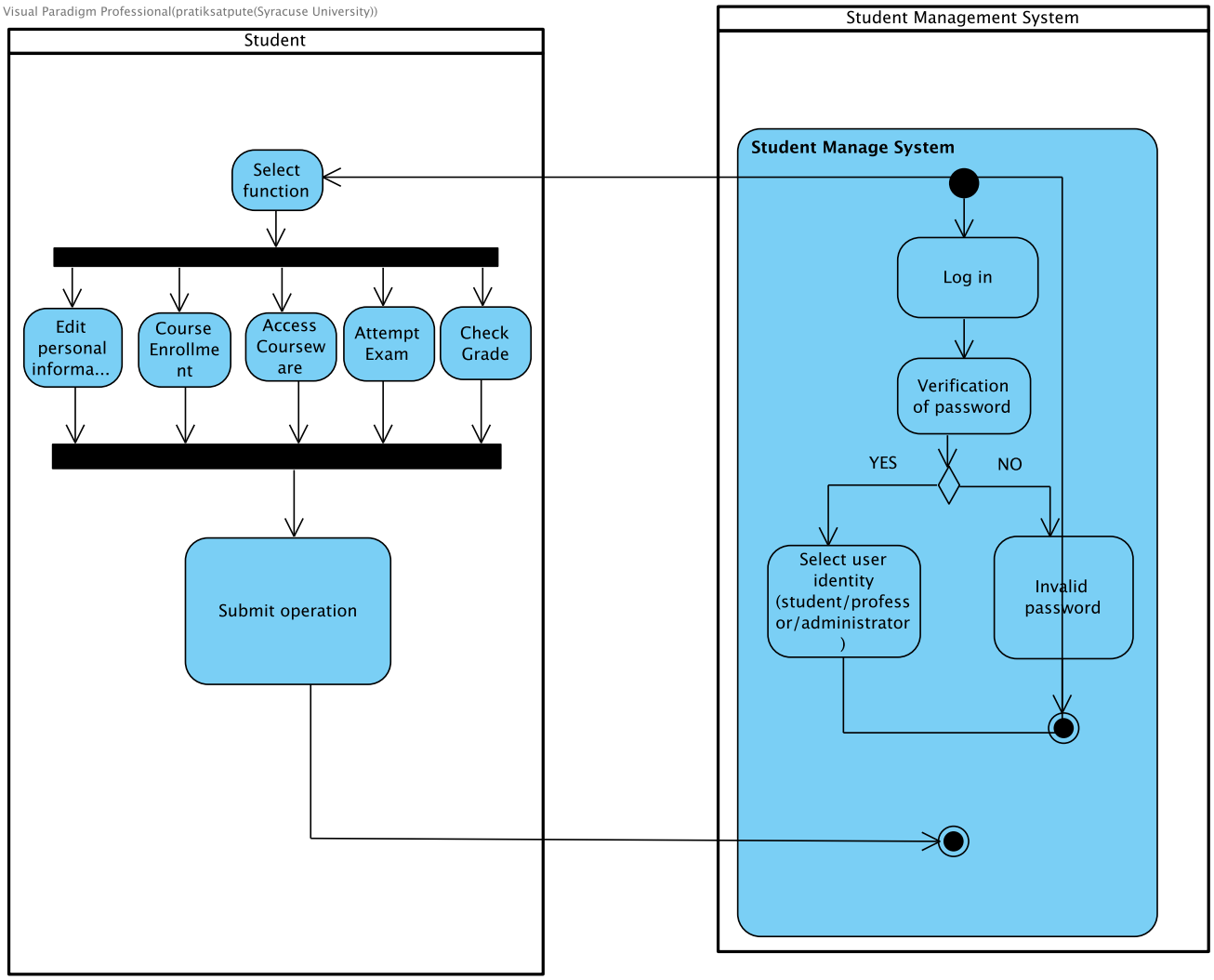
The system shall allow the selection of user identity (student/ professor/administrator) post-login based on verified credentials.

3.1.2.11.5. User Identification

ID: REQ072

The system shall present a login interface for user authentication.

3.1.3. Student Activity Diagram



3.1.3.1. Access Courseware

Serves as a gateway for students to access course materials and resources within the student management system. Allows registered students to view, download, and interact with courseware, including lecture notes, presentations, assignments, quizzes, and other educational materials provided by instructors. Students are presented with a user-friendly interface displaying a list of available courses and corresponding course materials. Students can navigate through the list of courses, select a specific course of interest, and access the associated courseware. Provides options for viewing course materials online or downloading them for offline access, depending on the student's preference. Will include search functionality, bookmarking, and progress tracking, enabling students to efficiently locate and manage course content.

3.1.3.2. Attempt Exam

Students access the function to attempt exams and assessments, utilizing a user-friendly interface that provides details such as exam title, duration, and instructions. During the exam attempt, students navigate through questions, provide responses, and utilize features like timers and question flagging to manage their time effectively. Ensures exam integrity through security measures.

3.1.3.3. Check Grade

Students access this function to retrieve information about their grades for completed assessments, assignments, and exams. Students are presented with a comprehensive overview of their academic records, including course grades, cumulative GPA, and individual assessment grades. Provides detailed breakdowns of grades by course, semester, or academic term, allowing students to track their progress over time. Additionally, students can view feedback from instructors, comments on assignments, and any additional information related to their grades.

3.1.3.4. Course Enrollment

Facilitates the process of course enrollment for students within the student management system. Enables students to browse available courses, select desired courses, and enroll in them for the upcoming academic term or semester. Upon accessing, students are presented with a comprehensive list of courses offered by the educational institution, along with detailed information about each course, including course title, description, prerequisites, schedule, and

instructor details. Students can navigate through the list of available courses, filter courses based on their academic program, interests, or requirements, and view additional course details to make informed enrollment decisions. Includes features such as course search, filtering, and sorting options to help students efficiently explore and identify suitable courses.

3.1.3.5. Edit personal information

Allows students to update and modify their personal information stored within the student management system. Students get to maintain accurate and up-to-date records by enabling them to make changes to their personal details, such as contact information, address, emergency contact information, and other pertinent data. Upon accessing, students are presented with a secure and user-friendly interface that displays their current personal information. Students can then review and edit the relevant fields as needed, providing updated information to reflect any changes in their personal circumstances.

3.1.3.6. Select function

3.1.3.7. Submit operation

3.1.3.8. Invalid password

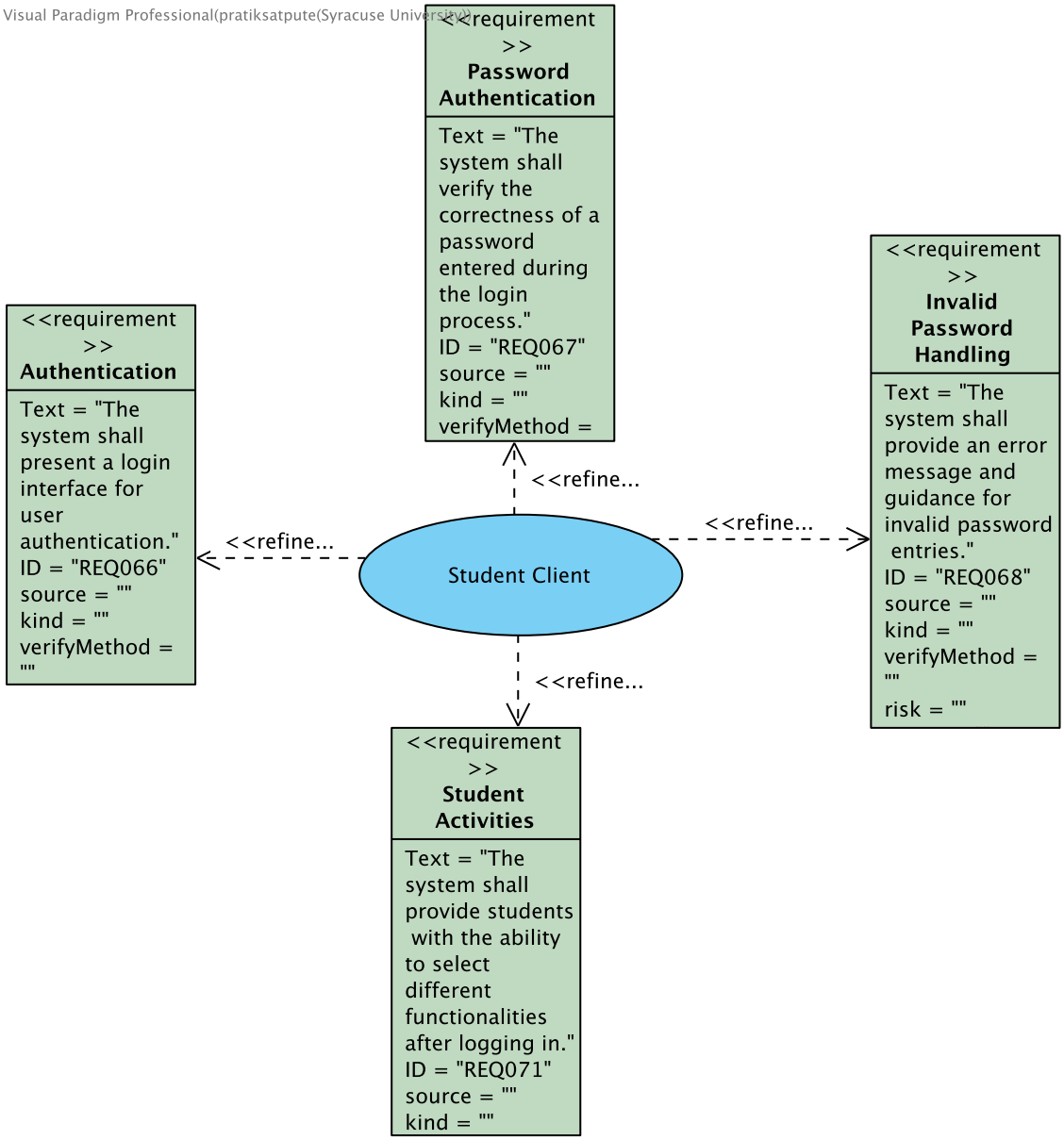
3.1.3.9. Log in

Allows users to securely access the student management system by providing their unique username and password.

3.1.3.10. Select user identity (student/professor/administrator)

3.1.3.11. Verification of password

3.1.3.12. Student Client System Requirement Diagram



3.1.3.12.1. Authentication

ID: REQ066

The system shall present a login interface for user authentication.

3.1.3.12.2. Invalid Password Handling

ID: REQ068

The system shall provide an error message and guidance for invalid password entries.

3.1.3.12.3. Password Authentication

ID: REQ067

The system shall verify the correctness of a password entered during the login process.

3.1.3.12.4. Student Activities

ID: REQ071

The system shall provide students with the ability to select different functionalities after logging in.

3.2. Performance Requirement

3.2.1. Intuitive User Interface

ID: REQ051

The user interface (UI) is clearly and consistently laid out and designed to ensure that new users are able to quickly master the basics without specialized training.

3.2.2. Security of User Data

ID: REQ052

The system implements encryption measures to protect user data in storage and transmission from leakage, tampering or loss.

3.2.3. System responsiveness

ID: REQ053

The system response time, i.e., the time from user-initiated request to system response, should be within predetermined performance standards, e.g., a response time of no more than 2 seconds under normal load.

3.3. Design Constraint

3.3.1. Accessibility

ID: REQ054

The system will support multiple languages to accommodate all users. Specifically, this includes English and Mandarin (Chinese). This will be accomplished through a multilingual user interface that includes menu items, instruction labels, help files, and user support resources.

3.3.2. Capacity

ID: REQ055

The system will be designed so that memory, CPU usage, and long-term storage (e.g., disk storage) are all reserved at least 50%. This means that under normal load, the system will not use more than 50% of its total capacity to ensure that the system will remain stable in the event of increased demand or sudden loads.

3.3.3. Data Encryption

ID: REQ056

The system will use data encryption in all interfaces to secure transmitted and stored data. This includes, but is not limited to, user authentication, transmission of personal information, and uploading of grades and course materials.

3.3.4. Information Assurance

ID: REQ057

The system will be compliant with business standard Information Assurance (IA) control requirements and Security Technical Implementation Guides (STIGS). This will ensure that the software is developed and deployed in compliance with information security and privacy protection standards in today's business environment.

3.3.5. Software Quality

ID: REQ058

The software will be developed and maintained in accordance with the industry standard ISO/IEC 5055:2021, which means that the software development process will adhere to the Software Quality Management and Assessment Guidelines, thus ensuring product quality and maintainability.