

# **41\_Lumina**

**Domain :** ‘Education and Academic Administration’

**Problem Statement -** ‘Course Enrollment And Academic Planning System’

**Team Members :**

S20240010132	Mahtab Alam
S20240010241	Manoj Thirunagari
S20240010134	M.Roshan Karthik
S20240010037	B.Ravi Kumar
S20240010120	K.Eswar Vardhan

## **Table Contents**

- 1.Preface
- 2.Introduction
- 3.System Requirements
  - a) Functional Requirements
  - b) Non Functional Requirements
4. UML Diagrams
  - a) Use Case Diagram
  - b) Activity Diagrams
  - c) Sequence Diagrams

# Preface

**Course Enrollment and Academic Planning System** provides a clear and shared understanding of how academic enrollment and planning activities are expected to function within an institution. The document is intended for students, faculty, academic coordinators, and the technical team involved in designing and implementing the system.

The system replaces fragmented and manual enrollment practices with a centralized, rule-based platform. Manual methods such as spreadsheets or online forms often lead to errors, delays, and inconsistent academic data. The system automates enrollment and academic planning according to predefined institutional rules.

Key academic concepts—such as **Course**, **Course Credit**, **Enrollment**, **Credit Requirements**, **Core Course**, **Degree Requirements**, **Academic Roadmap**, and **Degree Audit**—are formalized to ensure consistent interpretation and application of academic regulations. It performs real-time validation of prerequisites, credit limits, seat availability, and schedule constraints.

The system supports three main actors—**Student**, **Faculty**, and **Coordinator**—with defined responsibilities. Students plan and enroll in courses, faculty manage academic content and student evaluation, and coordinators configure academic rules, manage the course catalog, and control enrollment windows.

This document serves as a reference for developers, reviewers, and academic stakeholders, providing a foundation for system design, implementation, and future improvements

# Introduction

The Course Enrollment and Academic Planning System is a centralized academic platform that supports structured course registration and long-term academic planning. It enables a **Student** to enroll in courses based on predefined rules, track earned **Course Credits**, and plan future semesters through an **Academic Roadmap** aligned with institutional **Degree Requirements**. Every enrollment action is validated in real time to ensure compliance with prerequisites, credit limits, and curriculum rules.

The system also supports academic administration by providing role-specific capabilities to **Faculty** and **Coordinators**. Faculty members manage course details, instructional schedules, and academic rosters, while Coordinators configure enrollment policies, maintain the course catalog, and ensure conflict-free scheduling. Through these roles, the system enforces **Credit Requirements**, preserves the sequencing of **Core Courses**, and maintains consistency across departments.

By integrating enrollment, planning, and academic progress verification into a single platform, the system acts as a reliable reference for monitoring progress through automated **Degree Audit** mechanisms. This structured approach reduces administrative effort, eliminates data inconsistency, and ensures that students progress toward graduation in a transparent and regulation-compliant manner.

Supporting workflows include enrollment window configuration, academic roster management, degree audits, and exception handling through override requests. The system enforces institutional academic rules automatically, minimizing manual intervention and error.

# **System Requirements**

## **Functional Requirements :**

### **User Authentication and Authorization :**

- The system shall authenticate users based on their institutional credentials.

### **Enrollment Constraints And Configuration Window Management :**

- The system shall allow the Coordinator to define, update, and manage academic and enrollment policies, including the course catalog (courses, credits, prerequisites, core classifications), enrollment constraints, and enrollment windows.
- The system shall enforce enrollment constraints automatically, by blocking enrollments outside the active enrollment window, preventing scheduling conflicts such as overlapping course allocations, and supporting system-wide validation of eligibility.
- The system shall support administrative oversight and exception handling, by allowing Coordinators to intervene in and resolve exceptional enrollment or scheduling conflicts and by providing a system-wide indicator showing whether the enrollment window is active or inactive.

### **Course Catalog Management :**

- The system shall allow coordinators to create, update, and manage course details including course credits, prerequisites, and slot assignments.
- The system shall maintain a centralized course catalog accessible to students and faculty.

- The system shall ensure that prerequisite are consistently enforced across all related courses.

#### **Course Enrollment Management:**

- The system shall allow students to enroll in courses only during an active enrollment window.
- The system shall verify all Enrollment Constraints before confirming enrollment.
- The system shall automatically update the academic roster upon successful enrollment.

#### **Prerequisite and Credit Validation :**

- The system shall validate that all mandatory prerequisites are completed before allowing course enrollment.
- The system shall ensure that the student's total enrolled credits do not exceed institutional credit limits.
- The system shall block enrollment attempts that violate prerequisite or credit requirements and display appropriate error messages.

#### **Schedule Conflict Prevention :**

- The system shall prevent students from having overlapping course slots.
- The system shall validate slot assignments to avoid timetable conflicts during enrollment.
- The system shall notify the coordinator when a scheduling conflict occurs.

### **Academic Roadmap Generation :**

- The system shall allow students to generate a personalized academic roadmap spanning multiple semesters.
- The system shall perform a degree audit to identify completed, pending, and remaining degree requirements.
- The system shall validate prerequisite dependencies while creating or modifying the roadmap.
- The system shall allow students to save and update their academic roadmap for future reference.

### **Override Request Handling :**

- The system shall allow students to submit override requests when enrollment constraints cannot be met.
- The system shall allow the Coordinator to approve or reject override requests.
- The system shall update enrollment status automatically upon approval of an override request.

### **Academic Roster Management :**

- The system shall generate and maintain an official academic roster for each course.
- The system shall provide faculty members access to view enrolled student lists.
- The system shall ensure that rosters reflect only verified and validated enrollments.

# **Non Functional Requirements**

## **Performance Requirements :**

- The system shall process enrollment requests in real time with minimal latency.
- The system shall support concurrent enrollment attempts during peak enrollment periods.

## **Reliability and Availability :**

- The system shall ensure accurate enforcement of **Credit Requirements** and **Degree Requirements** at all times.
- The system shall ensure transactional consistency during high-load enrollment scenarios.

## **Security Requirements :**

- The system shall protect sensitive academic and personal data through secure authentication mechanisms.
- The system shall enforce role based access control for students, faculty and Co ordinators.
- The system shall maintain audit logs for critical operations such as enrollment approvals and overrides , to ensure accountability, and resolve disputes in the academic system.

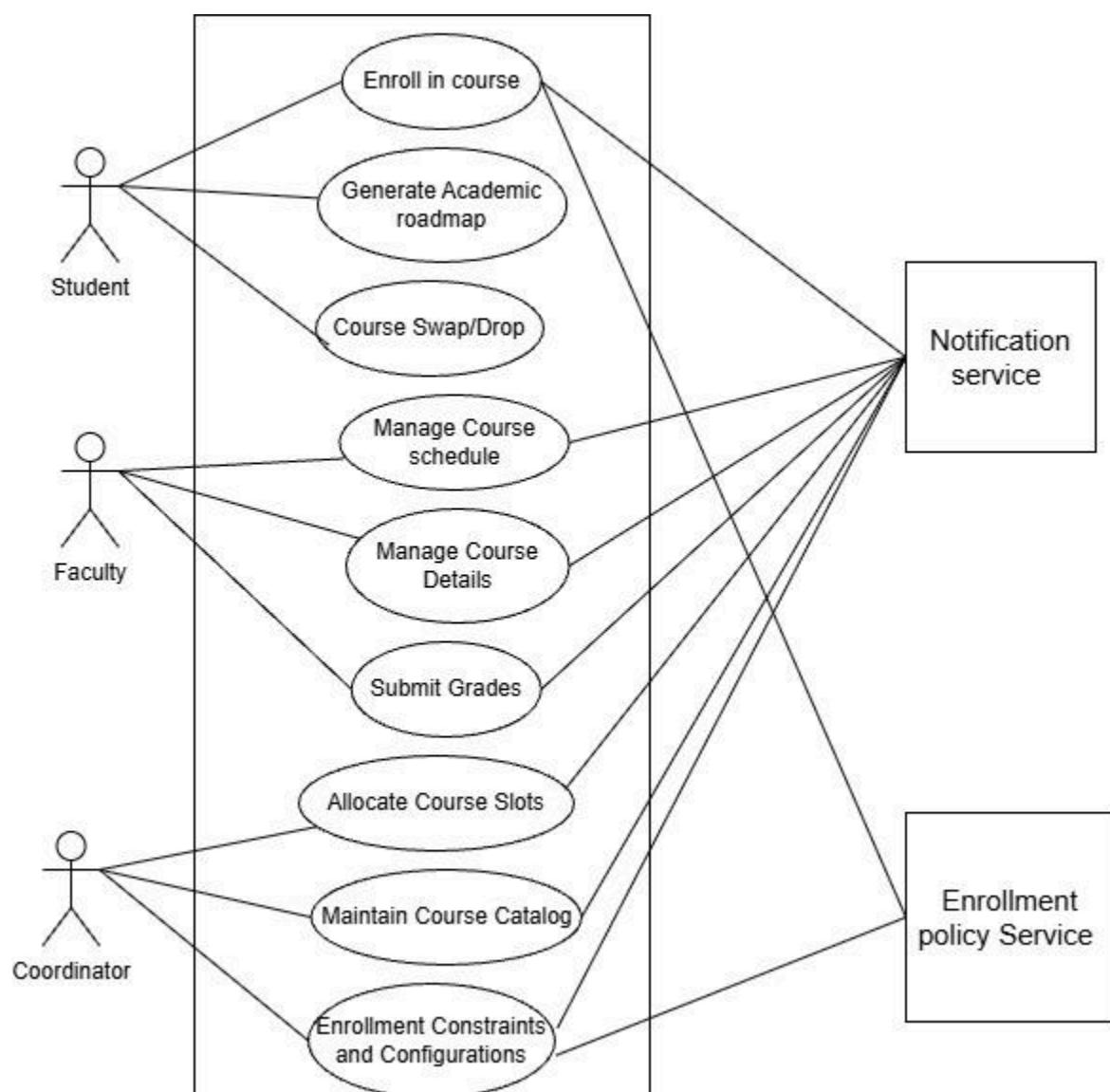
### **Usability Requirements :**

- The system shall provide a clear and intuitive user interface for students, faculty, and coordinators.
- The system shall display meaningful error messages when enrollment constraints are violated.

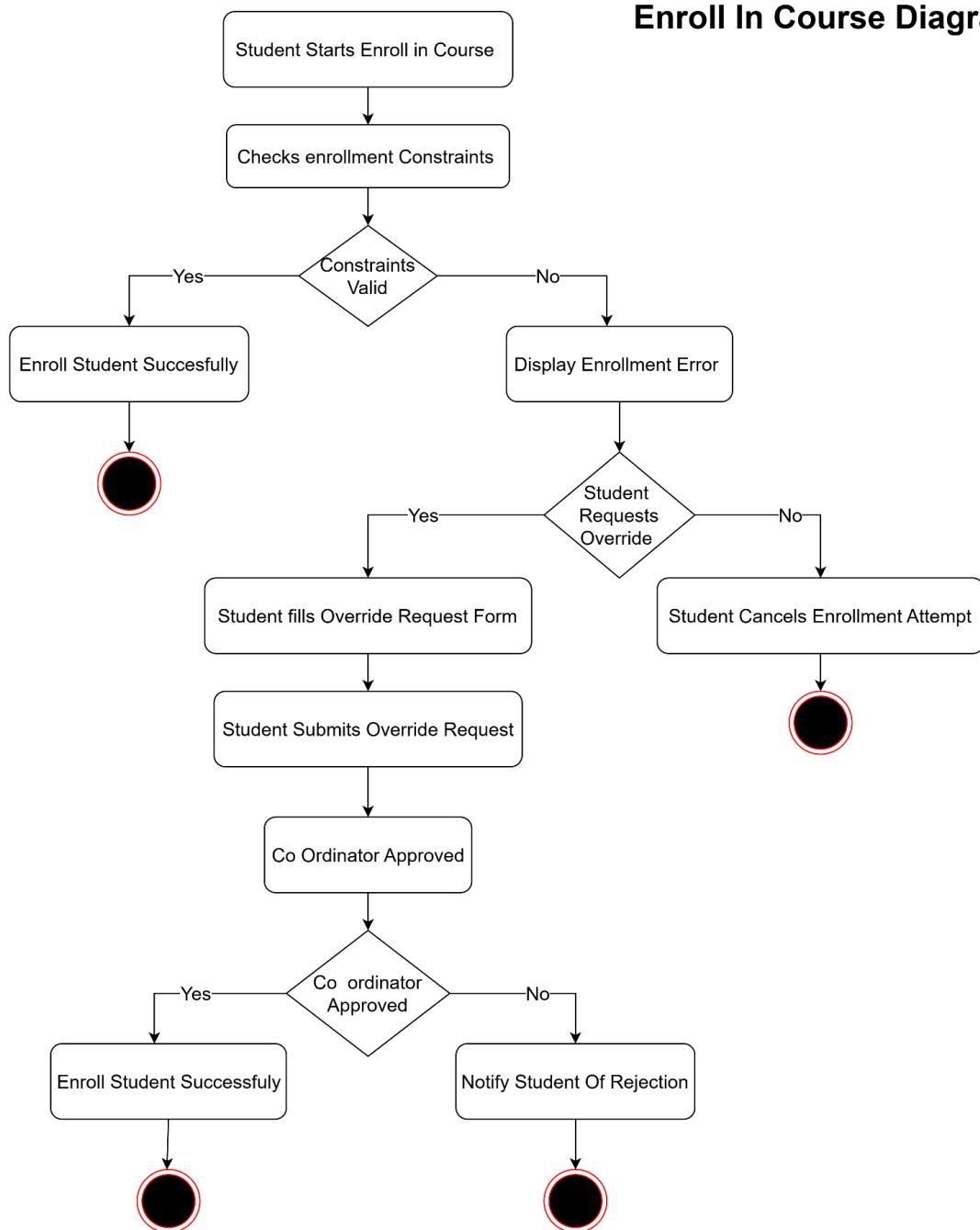
### **Scalability :**

- The system shall scale to support increasing numbers of users and courses without performance degradation. The system shall handle peak enrollment loads during registration windows.
- The system shall enforce all institutional academic policies without manual intervention.
- The system shall allow enrollment only within authorized enrollment windows.
- The system shall strictly adhere to defined prerequisite and credit requirement rules.

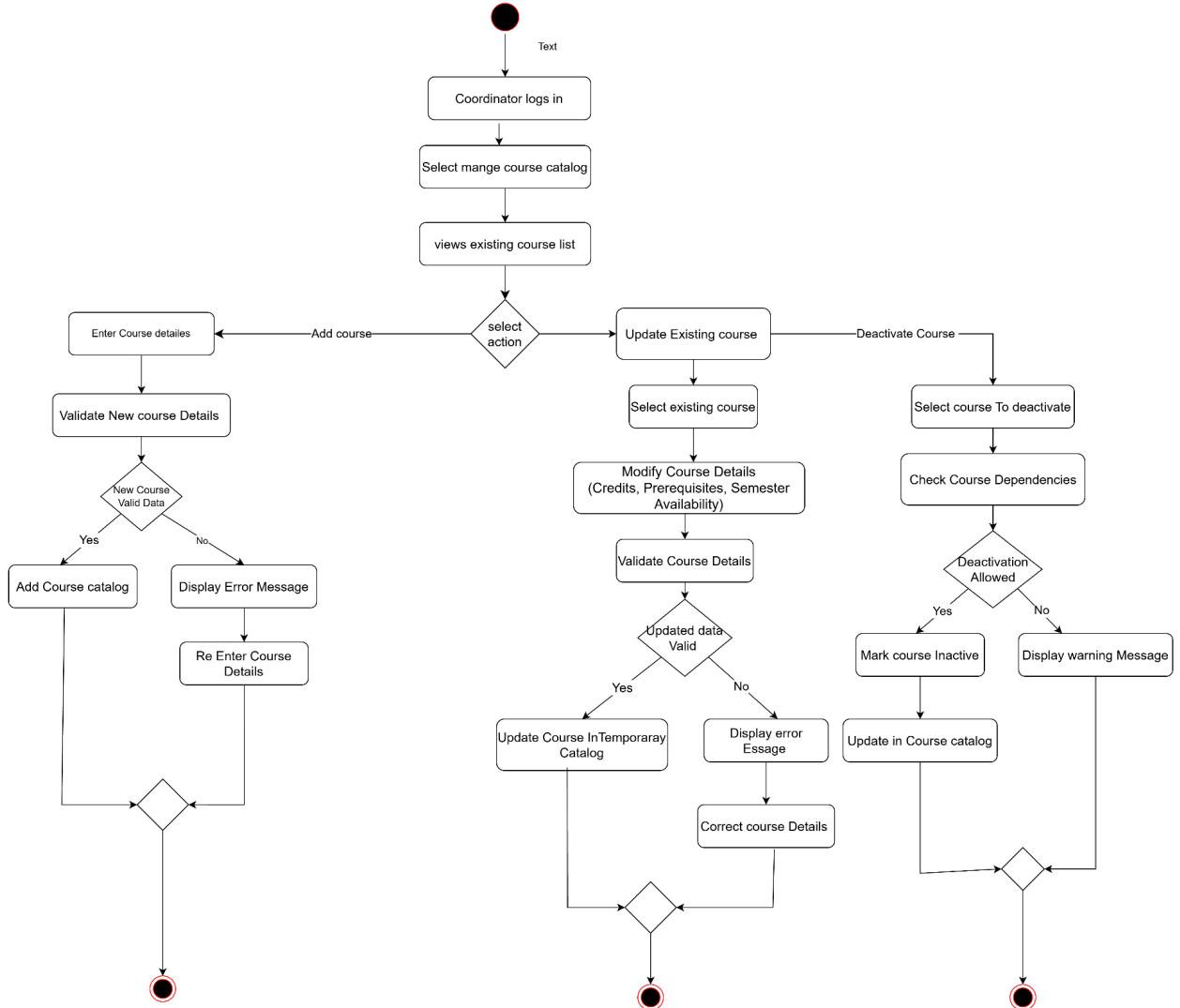
## Use Case Diagram



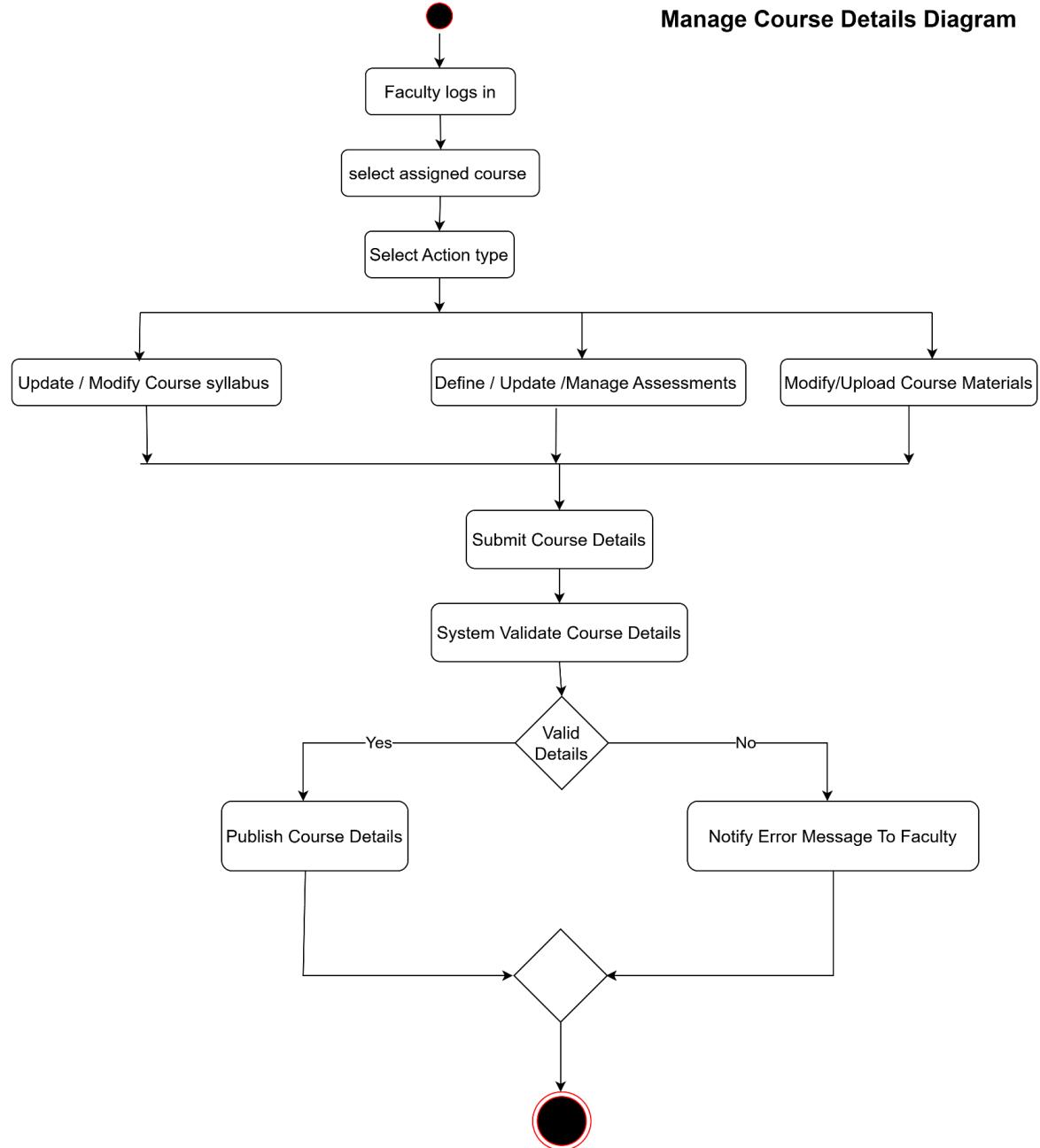
## Enroll In Course Diagram



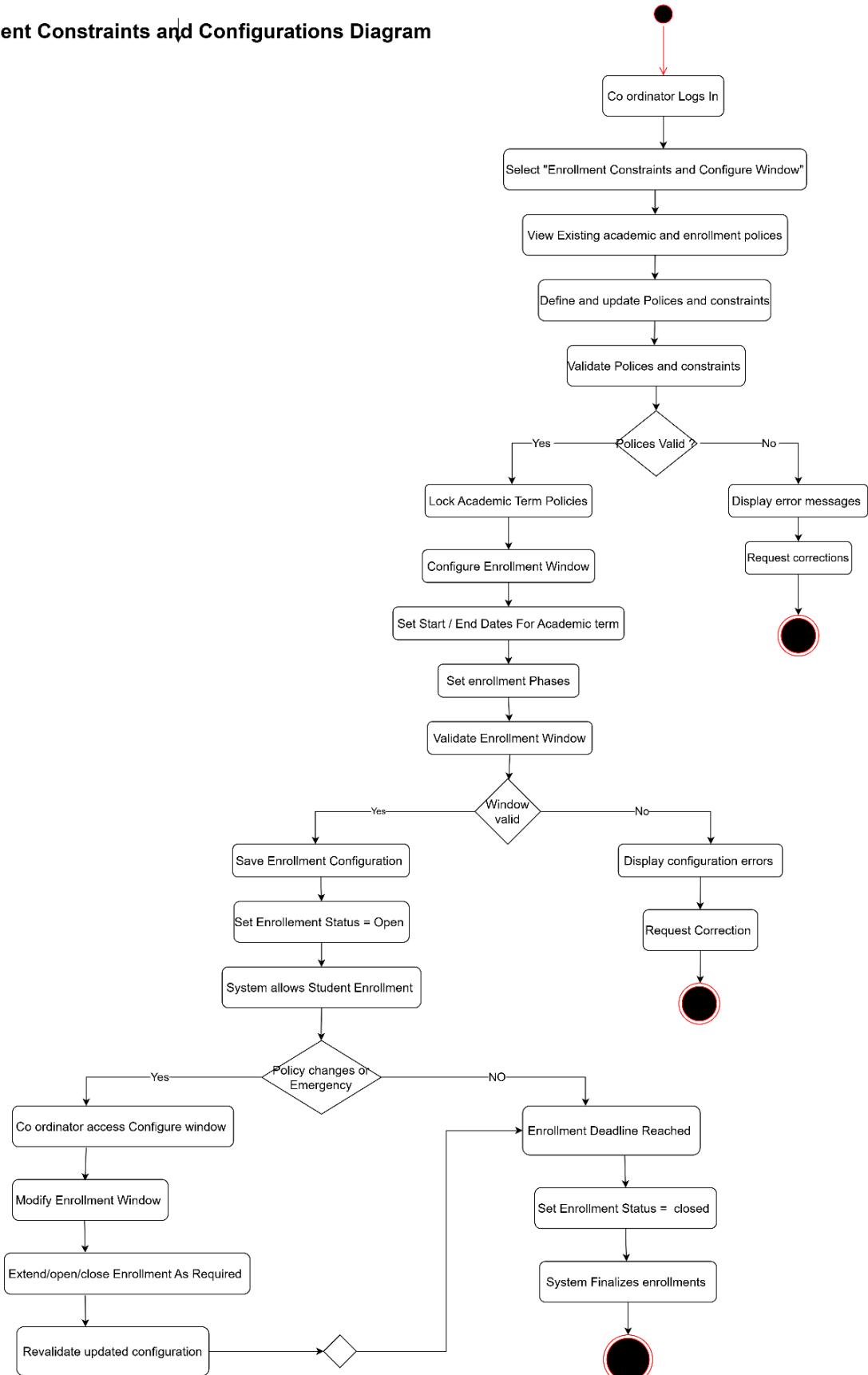
## Manage Course Catalog Diagram

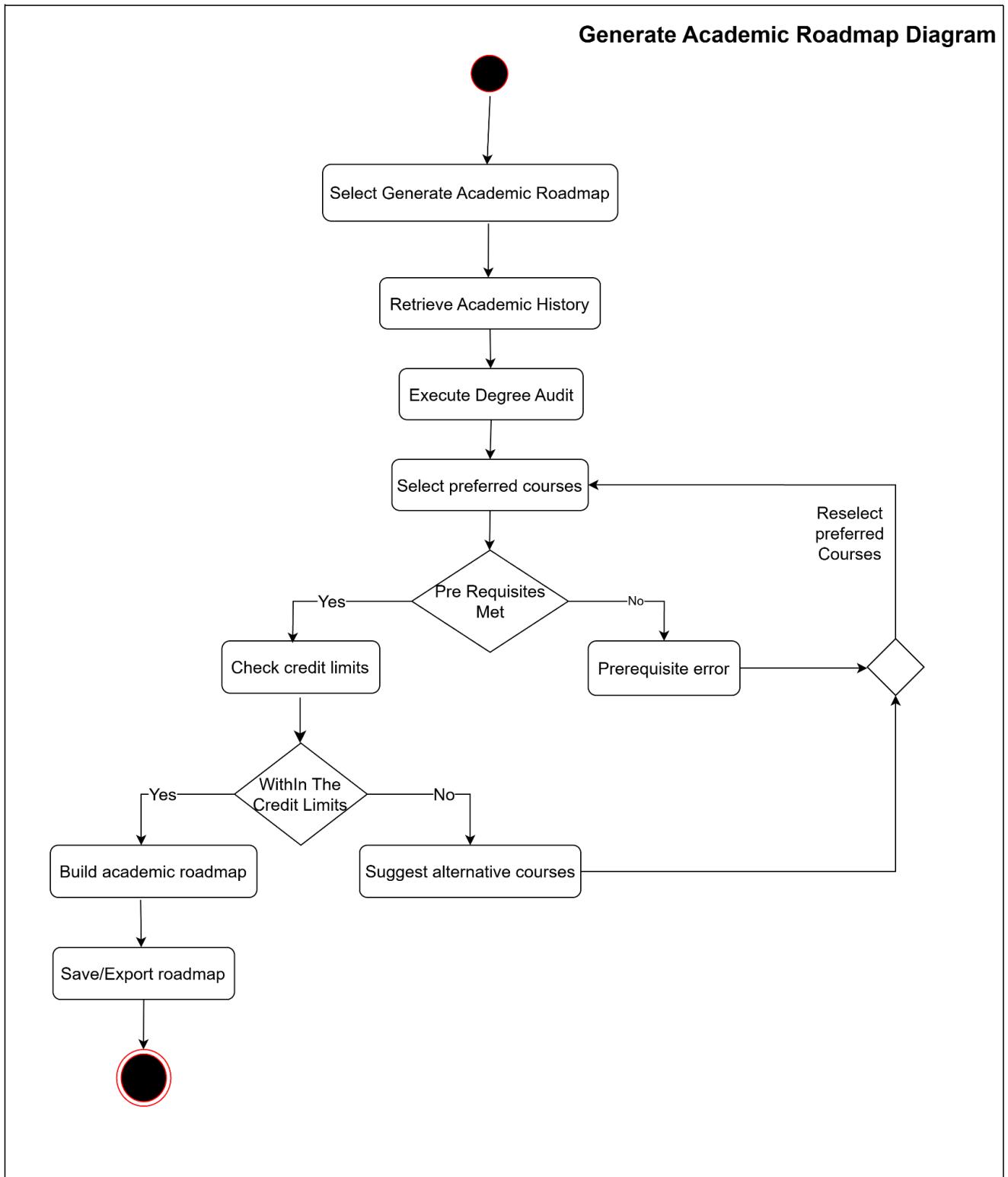


**Manage Course Details Diagram**



## Enrollment Constraints and Configurations Diagram





## Allocate Course Slots

