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Introduction

In today's fast-paced academic environment, students face numerous challenges in managing their educational experiences effectively. With increasing course offerings, evolving academic requirements, and the need for timely communication, a robust academic services system is essential for ensuring student success. The current system at PNU has served its purpose but now requires significant enhancements to meet the growing demands of its user base.

This project aims to transform the academic services platform into a more efficient, user-friendly, and engaging tool for students. By addressing critical issues such as outdated user interfaces, lack of essential features like course waitlisting, and inadequate notification systems, we strive to create a comprehensive solution that supports students throughout their academic journey.

The proposed enhancements will not only improve user experience through an intuitive design but also empower students with timely updates on grades and course availability. Additionally, the integration of an event calendar will facilitate better organization and planning for students, ultimately fostering a more supportive academic environment.

Problem Statement

The current academic services system faces several challenges that hinder student engagement and efficiency in managing their educational experience. Key issues include:

1. **User Interface Limitations:** The existing user interface is outdated and not user-friendly, making it difficult for students to navigate and access crucial information related to course scheduling and grades.
2. **Lack of Course Waitlist Features:** The system does not provide a waitlist option for popular courses, which can lead to frustration among students who are unable to enroll in desired classes.
3. **Inadequate Notifications:** There is no effective mechanism for notifying students about important updates, such as grade postings or changes in course availability. This lack of communication can result in students missing critical deadlines.
4. **Performance Issues:** The current system experiences slow load times and performance lags, particularly during peak registration periods, leading to a frustrating user experience.
5. **Absence of an Event Calendar:** The system lacks a centralized event calendar that would help students keep track of important academic dates, such as registration deadlines, exam schedules, and campus events.

To address these challenges, the proposed project aims to enhance the academic services system through the following improvements:

1. Improved User Interface: Redesigning the UI to be more intuitive and user-friendly, facilitating easier navigation.
2. Course Waitlist Feature: Implementing a waitlist option for courses that reach capacity, allowing students to be added automatically and be notified if spots become available.
3. Notifications and SMS Alerts for grades: Establishing a notification system to send SMS alerts for grades updates..
4. Improved Performance: Optimizing the system for faster load times and enhanced overall performance, especially during peak usage periods.
5. Event Calendar Integration: Incorporating a centralized event calendar that displays important academic dates and campus events, helping students stay organized.

These enhancements will create a more efficient, user-friendly, and engaging platform for students to manage their academic journey.

Methodology

For the development of the PNU Academic Portal, which aims to improve the user experience through a modernized interface, implement a course waitlist feature, provide real-time grade notifications via SMS, optimize overall system performance, and introduce an event calendar, the Incremental Model has been selected as the most suitable Software Development Life Cycle (SDLC) methodology.[6][7]

The Incremental Model is ideal for projects that involve progressive feature additions, require user feedback after each stage, and focus on continuous system improvement. Since this project consists of several distinct enhancements, developing each feature as a separate increment ensures higher quality, easier testing, and faster delivery of functional components.

Why the Incremental Model?

- The project consists of multiple independent features that can be developed and delivered in phases.
- It allows users to test and provide feedback on each feature before the next one is implemented.
- Minimizes risk by delivering working portions of the system early and adjusting future increments based on real user experience.
- Supports flexibility in case of any changes in requirements or the addition of new ideas during development.[1][2]

Incremental Model Phases Applied to the Project:

1. Requirements Analysis:

In this phase, we identify and prioritize the system requirements through:

- Analysis of the current banner system to determine its limitations.
- Collecting feedback from students, faculty, and administrators.
- Defining the essential features and breaking them into independent increments:
- Increment 1: Improved User Interface (UI).[3]
- Increment 2: Course Waitlist Feature.[5]
- Increment 3: Notifications and SMS Alerts for grade updates.[4]
- Increment 4: Performance Enhancements.
- Increment 5: Event Calendar Integration.

2. System Design:

For each increment, a detailed design is created to define the system architecture and user interactions.

- Increment 1 focuses on redesigning the user interface with better accessibility and usability.[3]
- Increment 2 includes the logic for managing course waitlists automatically.[5]
- Increment 3 integrates SMS APIs to deliver real-time notifications.[4]
- Increment 4 applies backend optimizations to increase system speed and reliability.[3]
- Increment 5 implements a dynamic event calendar linked to the academic schedule.

3. Implementation:

Each increment is developed independently in its own cycle:

- Increment 1: Develop and deploy the improved UI.[3]
- Increment 2: Implement the course waitlist system and integrate it into the registration process.[5]
- Increment 3: Configure the notification system and SMS integration.[4]
- Increment 4: Apply backend optimizations and measure system performance improvements.[3]
- Increment 5: Develop the event calendar module and integrate it with other academic tools.

4. Testing:

Testing is conducted after each increment to ensure it functions correctly and integrates smoothly with the existing system:

- UI usability testing to ensure a seamless user experience.[3]
- Functional testing of the waitlist to ensure fairness and accuracy.[5]
- Validation of SMS alerts and real-time notifications.[4]
- Load testing to evaluate system performance improvements.
- Verification of the accuracy and synchronization of the event calendar.

5. Deployment:

Each increment is deployed individually upon successful testing.

- Users are informed of new features as they become available.
- Documentation and training are provided for staff and students after each major release.
- Feedback from users is collected to guide future improvements and ensure satisfaction.

6. Maintenance:

Ongoing support is provided after each deployment phase to:

- Resolve any issues or bugs.
- Make adjustments based on user feedback.
- Prepare for the smooth integration of upcoming increments.
- Ensure continuous improvement of the system throughout the development lifecycle.



In summary, The Incremental Model provides a flexible and effective approach for enhancing the Banner system by delivering improvements in well-defined, manageable phases. This allows the university to deploy high-priority features early, ensure ongoing user satisfaction, and maintain a reliable and efficient academic services platform.

Project Charter

PROJECT CHARTER			
Project Title:	PNU Academic Portal		
Project Sponsor:	Princess Nourah University	Date Prepared:	8-3-2025
Project Manager:	Helah Almansour	Project Customer:	Princess Nourah University
Project Purpose:			
The purpose of the project is to transform the PNU Academic Services platform into a more efficient, user-friendly, and engaging tool for students. This includes improving the user interface, implementing features like course waitlisting, enhancing the notification system, and integrating an event calendar to support students' academic journey.			
High-Level Project Description:			
The PNU Academic Portal aims to modernize and enhance the existing academic services system by addressing key issues such as outdated user interfaces, lack of course waitlist features, inadequate notifications, and the absence of an event calendar. The project will improve the system's user experience, communication tools, and performance to better support students and academic staff.			
Project Boundaries:			
The boundaries of the project include the design and implementation of improvements to the academic services system. These improvements will focus on:			
<ol style="list-style-type: none"> 1. Redesigning the user interface. 2. Adding a course waitlist feature. 3. Implementing a notification system for grade updates. 4. Optimizing system performance. 5. Integrating an event calendar. 			
Key Deliverables:			
<ul style="list-style-type: none"> • Redesigned user interface. • Course waitlist feature implementation. • Notification system with SMS alerts for grade updates. • Performance enhancements for faster load times and smoother operation. • Event calendar integration. 			
High-Level Requirements:			
<ol style="list-style-type: none"> 1. A modern, intuitive user interface that enhances accessibility and usability. 2. A course waitlist feature that allows students to automatically join waitlists for full courses. 3. A notification system to provide students with updates on grades and course availability via SMS. 4. Optimized backend performance to improve system speed and reduce lag. 5. A centralized event calendar that displays important academic dates and campus events. 			

Project Objectives		Success Criteria	
<ul style="list-style-type: none">Enhance the UI fir better user experience and accessibility .Implement a course waitlist feature for efficient course enrollment management.<ul style="list-style-type: none">Notifications and SMS alerts for grade updates.Improve system performance for faster load times and smoother operation.<ul style="list-style-type: none">Integrate an event calendar for tracking academic and administrative events.		<ul style="list-style-type: none">Users find the new UI easier to navigate and more user-friendly.The course waitlist helps students enroll smoothly and reduces issues.Students and faculty receive timely grade notifications via app and SMS.The system runs faster and performs better.The event calendar is regularly updated and widely used.	
Scope:			
<ul style="list-style-type: none">Improve the user interface for better ease of use.Add a course waitlist feature.Set up SMS and app alerts for grades.Make the system faster and more efficient.Include an event calendar for university schedules.			
Time:			
Estimated completion within 6 months.			
Cost:			
<ul style="list-style-type: none">UI Redesign → \$12,000Course Waitlist Feature → \$9,000Notifications & SMS Alerts → \$6,000Performance Optimization → \$6,000Event Calendar Integration → \$5,000Testing & Deployment → \$4,000Hosting & Maintenance → \$5,500Total Estimated Cost à 47,500			
Other:			
The project must align with university IT policies and security guidelines.			
Summary Milestones		Due Date	
	UI Redesign Complete		March 20 , 2025

Course Waitlist Implementation	April 3, 2025
Notification System Setup	April 15, 2025
Event Calendar Integration	April 24 , 2025
Performance Optimization	May 5 , 2025
Final Testing & Deployment	May 15 , 2025
Stakeholder(s)	Role
University IT Department	System development, maintenance, and technical support
Students	End-users who will interact with the system for course registration and updates
Faculty	Manage courses, update schedules, and monitor student enrollments
University Administration	Approve and oversee system improvements and policies
Project Manager	Coordinate project development, stakeholder communication, and execution
External Software Vendors	Provide third-party integrations for notifications and UI enhancements
Project Manager Authority Level:	
Full authority within budget.	
Staffing Decisions:	
The project manager has the authority to assign developers, testers, and UI/UX designers as needed.	
Budget Management and Variance:	
The project manager oversees budget allocation and reports any variance to the sponsor.	
Conflict Resolution:	
The project manager is responsible for addressing team conflicts and ensuring smooth stakeholder communication.	

Sponsor Authority:			
<ul style="list-style-type: none"> • Approval of major changes to project scope. • Sign-off on milestone completion and final implementation. • Overseeing financial allocation for the project. 			
Approvals:			
Project Manager Signature:		Sponsor or Originator Signature:	
Project Manager Name:	Helah Almansour	Sponsor or Originator Name:	Princess Nourah University
Date:	4/3/2025	Date:	5/3/2025

Techniques for Collecting Requirements with Justification

In this project, we identified the following key stakeholders for requirement collection:

- Students (end-users who interact daily with the academic portal).
- Faculty members (who manage course schedules, grades, and communication).
- Administrative staff (who handle course enrollment, records, and backend operations).

To ensure that the PNU Academic Portal meets the needs of all stakeholders, we selected a combination of requirement collection techniques. These techniques were chosen to ensure accuracy, inclusivity, and relevance of the gathered information:

1. Surveys (Questionnaires)

Surveys were distributed to students, faculty members, and administrative staff to gather insights about current system challenges and expectations for improvement. This method is efficient for collecting input from a large number of users and identifying common pain points such as UI navigation issues, notification gaps, and course registration delays.

2. Interviews

One-on-one interviews were conducted with academic advisors, IT staff, and system administrators to gain a deeper understanding of the system's limitations and technical needs. Interviews provide qualitative insights that are often missed in surveys, especially for backend functionality and performance-related concerns.

3. Observation

The team observed students and staff using the current portal during course registration periods. This allowed us to detect usability issues, performance delays, and common errors in real-time—insights that users themselves might not be able to articulate.

4. Document Analysis

We reviewed user manuals, helpdesk reports, and previous system logs to identify recurring issues. This method provided a historical view of system limitations and supported evidence-based decision-making for future enhancements.

Project Requirements

The requirements are divided into four categories to ensure complete system coverage:

1. Software Requirements

- Backend: **Java** or **Node.js** for server-side processing [13][10]
- Frontend: **React.js** or **Angular** for responsive and dynamic UI [13]
- Database: **MySQL** or **PostgreSQL** for structured data storage [13]
- Notification API: **Twilio** or **Firebase** for SMS and push notifications [12]
- Hosting: **AWS** or **Microsoft Azure** for reliable cloud infrastructure

Explanation : The selected software components are chosen based on the nature of the system, scalability needs, and ease of integration. Java and Node.js are robust backend technologies commonly used in enterprise-level systems. React.js and Angular provide modern, responsive front-end experiences, ensuring better usability. MySQL and PostgreSQL are reliable database solutions suitable for structured academic data. Twilio and Firebase allow fast and secure implementation of notification services, while cloud providers like AWS and Azure ensure high system availability and performance.

2. Hardware Requirements

- University servers or cloud-based servers with:
 - Minimum **16 GB RAM** [8]
 - **Quad-core processor**
 - **500 GB SSD** storage [11]
- Devices:
 - Student and faculty devices (desktop, mobile, tablet) must support modern browsers

- SMS gateway hardware (if hosted internally)

Explanation : Hardware specifications are based on estimated system load during peak academic periods such as course registration. A minimum of 16GB RAM and quad-core processors are recommended for handling multiple concurrent requests efficiently. SSD storage is chosen to improve system performance. Student and faculty devices must support modern browsers to ensure compatibility with the updated interface. If SMS integration is hosted internally, a local gateway server may also be required.

3. Functional Requirements

- FR1: Users can log in using their university credentials
- FR2: Students can view, register, and join waitlists for courses
- FR3: System sends SMS/email notifications for grade updates
- FR4: Users can view an interactive event calendar with filters
- FR5: Admins can update course statuses, grades, and event schedules
- FR6: Real-time validation during course registration (e.g., conflicts, prerequisites)

Explanation : Functional requirements are derived directly from user needs and issues identified in the current system. Each function addresses a specific problem such as lack of waitlists, poor communication, or outdated navigation. By implementing these features, the system will better support students and faculty in managing their academic tasks efficiently.

4. Non-Functional Requirements

- **Usability:** Intuitive UI/UX for both students and faculty
- **Performance:** System must respond within 2 seconds during normal load and no more than 5 seconds during peak times [14]
- **Scalability:** Must support up to 50,000 concurrent users during registration periods
- **Reliability:** 99.9% uptime guarantee during semester periods
- **Security:** Must comply with PNU IT security standards including two-factor authentication (2FA) and encrypted data transmission [14] [15]
- **Accessibility:** Fully accessible to users with disabilities (WCAG 2.1 compliant) [14]

Explanation: These requirements focus on the quality and performance of the system. Usability ensures students can navigate easily. Performance and reliability targets are set based on common bottlenecks observed during peak load. Security and accessibility are crucial to comply with university IT policies and to provide inclusive access for all students.

Requirement Traceability Matrix (RTM)

Table 1: Requirement Traceability Matrix (RTM)

Req ID	Requirement Description	Source	Design Component	Test Case	Status
FR-1	Users can log in using university credentials	Interviews, Current System	Authentication Module	TC-001	Planned
FR-2	Students can view, register, and join course waitlists	Surveys, Observation	Registration & Waitlist Module	TC-002	Planned
FR-3	System sends SMS/email notifications for grade updates	Surveys, Research	Notification API (Twilio)	TC-003	Planned
FR-4	Users can view an interactive academic event calendar	Surveys, Document Analysis	Event Calendar Module	TC-004	Planned
FR-5	System performance optimized for high user load	Interviews, Logs	Backend Optimization Layer	TC-005	Planned
NFR-1	System responds within 2 seconds during normal load	Observation	Server Infrastructure + Caching	TC-006	Planned
NFR-2	Interface is user-friendly and accessible	Student Feedback	UI/UX Design (React/Angular)	TC-007	Planned
NFR-3	The system is accessible to students with disabilities	Best Practices (WCAG 2.1)	Accessibility Layer	TC-008	Planned
NFR-4	System is secure and compliant with university policies	Interviews, IT Guidelines	Secure Authentication + Encryption	TC-009	Planned

Project Scope Statement

PROJECT SCOPE STATEMENT

Project title: PNU Academic Portal

Date Prepared: March 8 , 2025

Project Scope Description:

This project aims to enhance the Banner system by improving the user interface, adding a course waitlist feature, enabling notifications and SMS alerts for grades, optimizing system performance, and integrating an event calendar.

Project Deliverables:

- A redesigned, user-friendly interface.
- A course waitlist system.
- Automated notifications and SMS alerts for grade updates.
- Improved system speed and performance.
- An event calendar for scheduling important dates.

Product Acceptance Criteria:

- **Users find the new UI easier to navigate.**
- **The course waitlist effectively manages enrollments.**
- **Notifications and SMS alerts are timely and accurate.**
- **System performance is significantly improved.**
- **The event calendar is fully functional and regularly updated.**

Project Exclusions:

- No changes to existing course structures or policies.
- No modifications to other university systems outside banner.
- No manual grade entry system ; notifications are automated.

Project Constraints:

- Limited budget of \$47,500.
- Completion deadline within 6 months.
- Must align with university IT policies and security standards.

Project Assumptions:

- The university IT team will support integration.
- User will adopt and use the new features effectively.
- Necessary approvals and resources will be available on time.

WBS

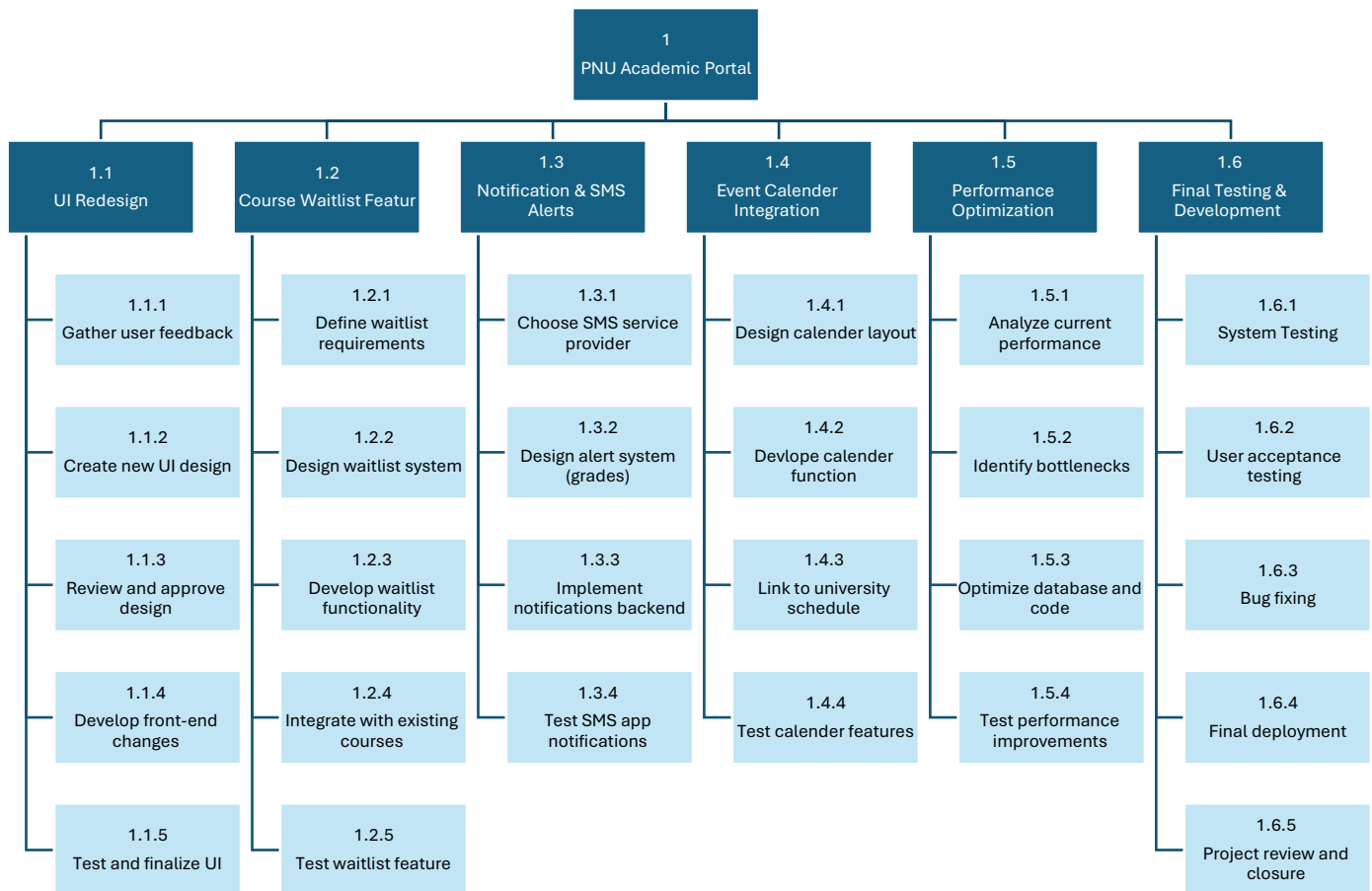


Figure 1: Work Breakdown Structure (WBS)

WBS Dictionary

WBS Dictionary Entry – March 10
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.1

WBS Item Name: UI Redesign

Description: The objective of this task is to enhance the user interface of the academic portal to ensure a modern, user-friendly, and accessible design for students and faculty. The UI team will begin by collecting feedback through surveys and user interviews to understand current pain points. Next, wireframes and mockups will be designed to reflect improvements in navigation, color scheme, and mobile responsiveness. These designs will be reviewed and approved by key stakeholders. Once approved, the development team will implement the changes using the latest front-end technologies. The task also involves cross-browser and mobile testing to ensure consistency across devices. Final approval will be required before deployment. This task is dependent on completion of user feedback (WBS 1.1.1) and must be completed before integration testing (WBS 1.6).

WBS Dictionary Entry – March 10, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.1.1

WBS Item Name: Gather User Feedback

Description: Collect user insights through surveys, interviews, and usage analytics to inform UI design decisions.

WBS Dictionary Entry – March 13, 2025
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Project Title PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.1.2

WBS Item Name: Create New UI Design

Description: Develop wireframes and mockups based on collected feedback, incorporating modern and accessible design principles.

WBS Dictionary Entry – March 17, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.1.3

WBS Item Name: Review and Approve Design

Description: Present designs to stakeholders for feedback, revision, and final approval.

WBS Dictionary Entry – March 18, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.1.4

WBS Item Name: Develop Front-end Changes

Description: Implement the approved UI design using frontend technologies and integrate it into the portal system.

WBS Dictionary Entry – March 20, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.1.5

WBS Item Name: Test and Finalize UI

Description: Perform UI testing across browsers and devices, fix issues, and finalize implementation.

WBS Dictionary Entry – March 24
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.2

WBS Item Name: Course Waitlist Features

Description: This task includes the analysis, design, and implementation of a waitlist feature for course enrollment. The waitlist system will allow students to join a queue for full classes and automatically notify them if a spot becomes available. The team will define the business rules (e.g., priority logic), design the user interface, and develop the backend logic. Integration with existing course registration modules will be required. The feature will be tested to ensure proper functionality and fairness. This task must be completed before the registration system is finalized during deployment (WBS 1.6).

WBS Dictionary Entry – March 24, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.2.1

WBS Item Name: Define Waitlist Requirements

Description: Collaborate with academic staff to identify rules, constraints, and scenarios for the waitlist feature.

WBS Dictionary Entry – March 26, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.2.2

WBS Item Name: Design Waitlist System

Description: Create system flow, interface, and backend logic plans for the waitlist feature.

WBS Dictionary Entry – March 28, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.2.3

WBS Item Name: Develop Waitlist Functionality

Description: Implement the backend and frontend logic to allow students to join and leave waitlists.

WBS Dictionary Entry – April 2, 2025

Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.2.4

WBS Item Name: Integrate with Existing Courses

Description: Connect the waitlist system with course registration modules and databases.

WBS Dictionary Entry – April 3, 2025

Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.2.5

WBS Item Name: Test Waitlist Feature

Description: Verify that the waitlist logic, notifications, and updates work correctly under various conditions.

WBS Dictionary Entry – April 7

Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.3

WBS Item Name: Notification & SMS Alerts

Description: This task involves the creation of a real-time notification system for academic updates such as grades, enrollment status, and deadlines. It also includes the integration of an SMS messaging service to send alerts directly to users' phones. The system will be designed to support customizable alert preferences and use reliable third-party SMS APIs. Backend services will be implemented to handle message queuing and logging. Rigorous testing will confirm successful message delivery and system stability. This feature enhances user engagement and must be functional before final deployment (WBS 1.6).

WBS Dictionary Entry – April 7, 2025

Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.3.1

WBS Item Name: Choose SMS Service Provider

Description: Evaluate and select a reliable SMS gateway for sending notifications to students.

WBS Dictionary Entry – April 8, 2025

Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.3.2

WBS Item Name: Design Alert System for (Grades)

Description: Create templates and triggers for academic alerts related to grades and deadlines.

WBS Dictionary Entry – April 11, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.3.3

WBS Item Name: Implement Notifications Backend

Description: Develop backend systems to handle alert generation and delivery.

WBS Dictionary Entry – April 15, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.3.4

WBS Item Name: Test SMS app notifications

Description: Simulate various alert scenarios and ensure SMS delivery to correct recipients.

WBS Dictionary Entry – April 17
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.4

WBS Item Name: Event Calendar Integration

Description : This task is about adding a calendar to the academic portal where students and staff can see important dates like class schedules, exam days, and university events. The calendar will be connected to the university's system so it updates automatically. It will also allow users to view events by day, week, or month.

WBS Dictionary Entry – April 17, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.4.1

WBS Item Name: Design calendar layout

Description: Create intuitive and visually clear layouts for the academic calendar feature.

WBS Dictionary Entry – April 21, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.4.2

WBS Item Name: Develop Calendar Function

Description: Implement the calendar UI and logic for event creation, reminders, and updates.

WBS Dictionary Entry – April 23, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.4.3

WBS Item Name: Link to university schedule

Description: Integrate the calendar with the university’s master schedule and academic database.

WBS Dictionary Entry – April 24, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.4.4

WBS Item Name: Test calendar features

Description: Conduct tests for date accuracy, syncing, and user interaction within the calendar.

WBS Dictionary Entry – April 28
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.5

WBS Item Name: Performance Optimization

Description: This task includes identifying performance issues within the academic portal and applying technical improvements to boost speed, efficiency, and scalability. Areas of focus include backend processes, database queries, frontend load times, and server configurations. Tools such as load testing software and performance monitoring dashboards will be used. Optimization techniques will include caching, query optimization, and code refactoring. Benchmarking results will be compared pre- and post-optimization to validate improvements. This task supports overall system quality and precedes final testing and deployment (WBS 1.6).

WBS Dictionary Entry – April 28, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.5.1

WBS Item Name: Analyze Current Performance

Description: Assess portal performance using monitoring tools to identify inefficiencies.

WBS Dictionary Entry – April 30, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.5.2

WBS Item Name: Identify Bottlenecks

Description: Locate database, code, or server-side processes causing slowdowns.

WBS Dictionary Entry – May 2, 2025

Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.5.3

WBS Item Name: Optimize database and code

Description: This task is about making the portal faster by improving how the code and database work. We will fix slow parts, clean up the code, and make sure the database answers faster. The goal is to help the system run more smoothly, especially when many people use it at the same time.

WBS Dictionary Entry – May 5, 2025

Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.5.4

WBS Item Name: Test performance improvements

Description: In this task, we will test the system after making it faster to see if it really improved. We'll check how fast it loads, how well it works under pressure, and if anything breaks. If problems show up, we'll fix them before moving to the next step.

WBS Dictionary Entry – May 7

Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.6

WBS Item Name: Testing and Final Deployment

Description: This final project phase involves comprehensive system testing, bug fixing, and deployment of the academic portal to the live environment. Testing will cover system integration, performance, security, and user acceptance. Any bugs discovered will be documented, fixed, and verified. Once testing is complete and sign-off is received, the system will be deployed and monitored. A formal review will be held to close out the project. This task marks the end of development and must be preceded by the successful completion of all feature tasks (WBS 1.1–1.5).

WBS Dictionary Entry – May 7, 2025

Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.6.1

WBS Item Name: System Testing

Description: Run integration, regression, and unit tests to ensure all components function together.

WBS Dictionary Entry – May 9, 2025

Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.6.2

WBS Item Name: User Acceptance Testing

Description: Involve real users in testing to validate usability and functionality.

WBS Dictionary Entry – May 13, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.6.3

WBS Item Name: Bug fixing

Description: Address and resolve any issues found during testing phases.

WBS Dictionary Entry – May 15, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.6.4

WBS Item Name: Final Deployment

Description: Release the final system version to production and monitor its launch.

WBS Dictionary Entry – May 15, 2025
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Project Title: PNU Academic Portal – Princess Nourah University (PNU)

WBS Item Number: 1.6.5

WBS Item Name: Project Review and Closure

Description: Document lessons learned, close contracts, and officially complete the project.

RACI Chart

Table 2: RACI Chart

WBS ID	Task Description	Project Manager	UI/UX Team	Developers	QA Team	IT Department
1.1	UI Redesign	A	R	C	I	C
1.2	Course Waitlist Features	A	C	R	C	R
1.3	Notifications & SMS Alerts	A	C	R	C	R
1.4	Event Calendar Integration	A	C	R	C	R
1.5	Performance Optimization	A	I	R	C	R
1.6	Testing and Final Deployment	A	I	C	R	C

Gantt Chart

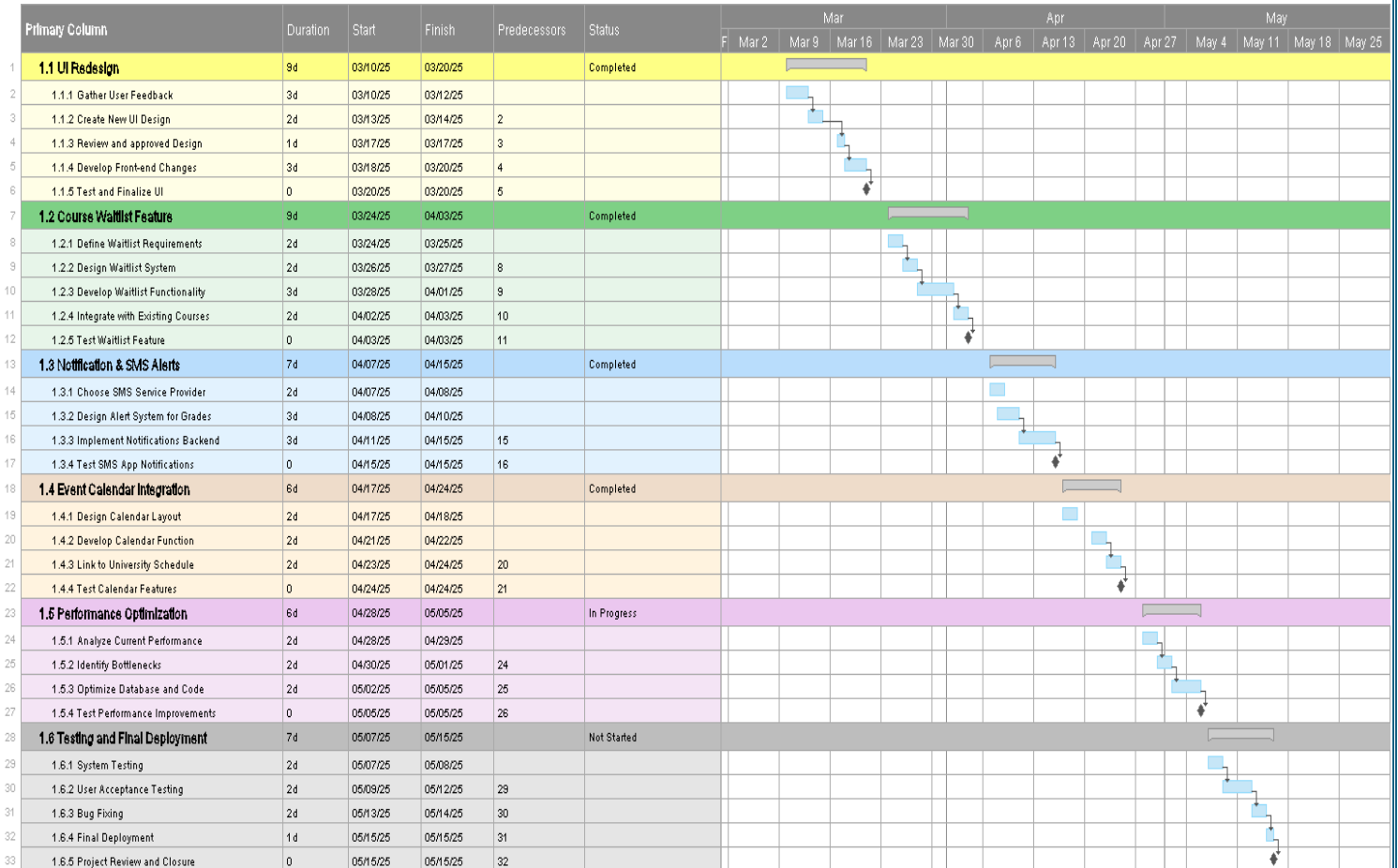


Figure 2: PNU Academic Portal Gantt Chart

Risk Register

Table 3: Risk Register

No.	Rank	Risk	Description	Risk Type	Category	Root Cause	Triggers	Risk Strategy	Risk Owner	Probability	Impact
R1	1	Skill Gap in Team	Lack of technical skills causing delay in feature development	Negative	Technical	New technologies unfamiliar to team	Missed deadlines, quality issues	Mitigation (Early training, mentorship sessions)	Project Manager	Medium	High
R2	2	Integration Issues with SMS API	Integration of notification system may fail or be unstable during testing	Negative	Technical	API mismatch, server errors	Failed notifications, testing failures	Mitigation (Multiple rounds of API testing, backup provider)	IT Department	Medium	High
R3	3	Server Downtime During Migration	Portal may go offline during migration to new system	Negative	Technical	Insufficient server capacity, migration errors	Downtime during transition	Transfer (Use managed hosting with strong uptime guarantees)	IT Department	Low	High
R4	4	User Resistance to Change	Students and faculty prefer old portal layout and resist using new system	Negative	Human	Familiarity bias, lack of training	Negative feedback, complaints	Mitigation (Training workshops, tutorials)	Project Manager	Medium	Medium
R5	5	Expanding Portal Scope	Early completion could allow adding bonus features like course recommendations	Positive	Technical	Efficient development and faster progress	Early delivery of core features	Enhance (Add limited, planned extra features)	Project Manager	Medium	Medium
R6	6	Early Launch Opportunity	Launching early for summer students if the system stabilizes	Positive	Technical	Strong early testing results	Core modules tested and stable early	Enhance (Soft launch for selected user groups)	IT Department	Medium	Medium
R7	7	Partnering with Telecom Provider	Partner with a telecom company to sponsor SMS alerts and marketing	Positive	External	High volume of SMS communications	Interest from telecom companies	Exploit (Negotiate partnerships for sponsorships)	Project Manager	Low	High
R8	8	Winning Innovation Award	University could apply for awards due to portal innovation	Positive	External	Unique features like smart waitlists, SMS integration	Award announcements	Exploit (Apply for awards, document innovations)	University Administration	Low	High

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