**REQUIREMENTS DOCUMENT FOR STUDENT MANAGEMENT SYSTEM (SMS)**

1. **Overview**

This **documen**t outlines the application requirements for a **Student Management System (SMS),** which will help streamline student data management, facilitate course enrollment, and generate reports to support administrative tasks and enhance the educational experience.

1. **KEY FEATURES**
2. **Student Records Management:**

Create, update, and manage comprehensive student profiles, including personal details.

1. **Subject Management:**

Facilitate course creation, updates, and access to course information, including prerequisites, syllabus, and instructors.

1. **Enrollment Management:**

Enable students to enroll in subjects, manage enrollment requests, and track enrollment status.

1. **Report Generation:**

Generate various reports for administrative and academic needs, including the number of students enrolled and enrollment statistics.

1. **User Authentication & Authorization:**

Secure access and permissions for students and administrators.

1. **Functional Requirements**
   1. **Student Records Management**

FR-1: The system should allow administrators to create, update, and delete student profiles, including personal details and academic history.

FR-2: The system should allow students and authorized staff to view student profiles, ensuring proper access to academic and personal data.

FR-3: The system should record and store student attendance for each course.

FR-4: The system should track and update students' academic performance across courses, including grades and overall progress.

* 1. **Subject Management**

FR-5: The system should allow administrators to create, update, and delete subject/course information, including course titles, syllabi, and prerequisites.

FR-6: The system should allow students to view subject details, including syllabi, prerequisites, and instructor information.

FR-7: The system should enable instructors to manage course materials and assignments, including uploading resources and setting deadlines.

FR-8: The system should ensure that subject information is always up to date and accurate for all users.

* 1. **Enrollment Management**

FR-9: The system should allow students to enroll in and withdraw from courses or subjects.

FR-10: The system should notify students and instructors upon successful enrollment or withdrawal.

FR-11: The system should enforce prerequisite checks, restricting enrollment based on prerequisites for each course.

FR-12: The system should track and manage student enrollment status, including waitlists and course capacity.

* 1. **Report Generation**

FR-13: The system should generate attendance reports for each course, showing both student attendance and course-wide patterns.

FR-14: The system should generate performance reports for students, detailing grades, assignments, and overall progress in each course.

FR-15: The system should generate enrollment statistics for each academic term, including total student enrollment, course popularity, and enrollment distribution across subjects.

FR-16: The system should allow administrators to customize reports based on specific criteria (e.g., performance thresholds, attendance rates).

* 1. User Authentication & Authorization

FR-17: The system should support secure login for different roles (Student, Instructor, Administrator), ensuring that only authorized users can access the system.

FR-18: The system should implement role-based access control (RBAC), ensuring that users can only access features and data relevant to their role.

FR-19: The system should ensure secure user authentication, protecting sensitive data and preventing unauthorized access to student or academic information.

1. **Non-Functional Requirements**

**NFR-1: Performance**

• The system should be able to handle concurrent access by multiple users without significant delays, ensuring smooth operation even during peak times (e.g., course registration periods).

**NFR-2: Scalability**

• The system should be designed to scale with increasing numbers of students, courses, and enrollments over time, ensuring reliable performance as usage grows.

**NFR-3: Usability**

• The system’s interface should be user-friendly and easy to navigate for all users (students, instructors, and administrators), with intuitive features for accessing key functionalities.

**NFR-4: Reliability**

• The system should ensure data integrity by preventing data loss or duplication, particularly for important student information like attendance and grades.

**NFR-5: Security**

• The system should implement robust security measures to protect against unauthorized access to sensitive student and academic data, using encryption and secure login protocols.

**NFR-6: Availability**

• The system should be available 24/7 with minimal downtime for maintenance, ensuring consistent access for users across different time zones and periods.

**KEY COMPONENTS:**

1. **Students:**

Stores information about each student, including personal details, academic history, and enrollment status.

1. **Subjects**

Manages subject information, such as course ID, title, syllabus, prerequisites, and instructor details.

1. **Enrollments:**

Tracks the status of student enrollments, including current courses, withdrawals, and waitlist status.

1. **Users:**

Manages user roles (Student, Instructor, Administrator) and handles role-based access control.

1. **Reports:**

Generates reports based on student performance, attendance, and enrollment data for administrative and academic use.

1. **Authentication & Authorization:**

Manages secure login, and enforces role-based permissions for system access

Key Components

**Students**: Stores information about each student, including personal details, and enrollment status.

**Subject**: Manages course information, including course ID, title, syllabus, and prerequisites.

**Enrollments**: Tracks each student's enrollment status, including current subject

**Users**: Manages user roles, including students, instructors, and administrators.

**Reports**: Generates various reports based on student enrollment data.

**Authentication & Authorization**: Manages secure access based on user roles to ensure data privacy.