

# Software Requirements Specification (SRS)

## 1. Introduction

### 1.1 Purpose

This SRS describes the requirements for a web application to manage Internal Assessment (IA) marks, attendance, and timetable scheduling for an Engineering College with multiple UG and PG departments. The application is designed to streamline the process of attendance, IA management, timetable handling, and result processing, ensuring compliance with dynamic assessment patterns and providing customizable functionalities for departments and faculty.

### 1.2 Scope

The application will:

- Allow faculty to manage attendance and IA marks.
- Enable departments to customize assessment patterns, marks distribution, and qualification criteria.
- Facilitate bulk uploads of marks and attendance using Excel.
- Support dynamic question paper patterns with COs, POs, TLOs, BL levels, and optional questions.
- Allow students to view their attendance and marks.
- Provide a mechanism to freeze data to ensure integrity before generating hall tickets.
- Enable the exam department to process hall tickets and semester-end marks.
- Generate NBA-compliant course files with attainment levels.

### 1.3 Audience

- College Administration
- Faculty Members
- Department Heads (HODs)
- Exam Department Staff
- Students

### 1.4 Definitions and Acronyms

- **COs:** Course Outcomes
- **POs:** Program Outcomes
- **TLOs:** Topic Learning Outcomes
- **BL:** Bloom's Taxonomy Level
- **NBA:** National Board of Accreditation

## 2. System Overview

The web application will consist of the following modules:

1. **Admin Module:** Manage user roles, department settings, and global configurations.
2. **Faculty Module:** View timetable, take attendance, enter and freeze marks.
3. **HOD Module:** Approve and freeze data submitted by faculty.
4. **Exam Department Module:** Generate hall tickets and process final marks.
5. **Student Module:** View attendance and marks.
6. **Dynamic Assessment Module:** Handle varied assessment patterns and bulk uploads.

### 3. Functional Requirements

#### 3.1 User Roles and Authentication

- Role-based access control for Admins, Faculty, HODs, Exam Department, and Students.
- Secure login and password management.

#### 3.2 Timetable Management

- **Admin/Department:**
  - Upload timetable for each department.
- **Faculty:**
  - View timetable.
  - Mark attendance for each class.

#### 3.3 Attendance Management

- Easy interface for faculty to take attendance.
- Option for bulk attendance upload via Excel.
- Attendance reports for students and faculty.

#### 3.4 Internal Assessment Marks Management

- **Dynamic Pattern Management:**
  - Define assessment types (IA1, IA2, Assignment 1, Assignment 2, etc.) per subject.
  - Define COs, POs, TLOs, BL levels, and optional questions for each question.
- **Marks Entry:**
  - Enter marks for each assessment.
  - Support for bulk upload of marks via Excel.
- **Customizations:**
  - Departments can set min/max marks and passing criteria.
  - Marks can be scaled to a total of 50 or other department-defined values.
- **Freezing:**
  - Faculty freeze marks after entry.
  - HOD freezes marks after faculty submission.

#### 3.5 Hall Ticket Generation

- Automatic generation of hall tickets for qualified students based on frozen data.
- Printable hall ticket format in the Exam Department module.

### **3.6 Final Marks and Course File**

- Upload semester-end marks for each subject.
- Generate NBA-compliant course files with attainment levels.

### **3.7 Student Portal**

- Students can:
  - View their attendance.
  - View their marks for each assessment and final scores.

### **3.8 Reporting**

- Attendance and marks reports for departments, faculty, and students.
- Exportable reports in PDF/Excel format.

## **4. Non-Functional Requirements**

### **4.1 Usability**

- Intuitive UI for faculty and department staff to take attendance and upload marks.
- Dynamic adaptability to changes in assessment patterns.

### **4.2 Scalability**

- Support for multiple departments and hundreds of students per department.

### **4.3 Performance**

- Ensure fast processing for bulk uploads and data freezing.

### **4.4 Security**

- Data encryption for sensitive information.
- Role-based access and audit logs.

## **5. System Architecture**

### **5.1 Technologies**

- **Frontend:** React.js/Angular.js
- **Backend:** Node.js/Express or Django
- **Database:** MySQL/PostgreSQL
- **Hosting:** AWS/Azure/GCP

## **5.2 Integration**

- Excel import/export for bulk operations.
- Compliance with NBA formatting for course files.

## **6. User Stories**

1. As a faculty member, I want to upload attendance and IA marks easily, so I can manage my classes efficiently.
2. As an HOD, I want to freeze submitted data, so I can ensure its integrity before forwarding it to the exam department.
3. As a student, I want to view my attendance and marks online, so I can track my academic progress.
4. As an admin, I want to customize assessment patterns and marks distribution for each department, so the system meets institutional requirements.

## **7. Constraints**

- Must handle varied assessment patterns dynamically.
- Should support integration with existing ERP systems if needed.

## **8. Future Enhancements**

- Integration with mobile apps for student and faculty use.
- AI-based analytics for predicting student performance.

# **IA and Attendance Management Application Design Details**

## Login Page:

- **Purpose:** Authenticate users based on roles (Admin, HOD, Faculty, Students, Exam Department).
- **Page Details:**
  - Form with:
    - Username field
    - Password field
    - Login button
  - Role dropdown for selecting user type.
  - Error message for invalid credentials.
  - Redirect to respective dashboards after successful login:
    - Admin Dashboard
    - Department Dashboard (HOD)
    - Faculty Dashboard
    - Student Dashboard
    - Exam Department Dashboard

## 1. Admin Module

### Admin Dashboard:

- **Page Details:**
  - Overview cards displaying:
    - Total departments
    - Total students
    - Total faculty
  - Navigation links to:
    - Manage Departments
    - Manage Users
    - Approve Students
    - System Configuration

### Manage Departments:

- **Page Details:**
  - Table displaying all departments:
    - Department Name
    - HOD Name
    - Total Students
    - Total Faculty
  - Actions:
    - Add Department: Modal with form to enter department name and assign HOD.
    - Edit Department: Update details.
    - Delete Department: Confirmation dialog before deletion.

### Manage Users:

- **Page Details:**
  - Tabs for different user types (Admins, Faculty, Exam Staff).
  - Add User:
    - Modal with fields: Name, Email, Phone, Role, and Password.
  - Edit/Delete user functionality.

## **Approve Students:**

- **Page Details:**
  - Table of students registered by departments:
    - Student Name
    - Department
    - Batch
    - Status (Pending, Approved, Rejected)
  - Actions:
    - Approve/Reject student profiles.

## **System Configuration:**

- **Page Details:**
  - Settings for:
    - Password policies
    - Application-wide configurations
    - Notifications

## **2. Department Module**

### **Department Dashboard:**

- **Page Details:**
  - Overview cards displaying:
    - Total Students
    - Total Faculty
    - Total Batches
  - Tabs for:
    - Configure Evaluation Patterns
    - Manage Faculty
    - Manage Students
    - Generate Reports

### **Configure Evaluation Patterns:**

- **Page Details:**
  - Workflow:
    1. Select Subject and Batch.
    2. Configure components:

- Add IA1, IA2, Assignment1, Assignment2, or other custom components.
  - Set max marks and weightage for each component.
  - Define which components are mandatory or optional.
- 3. Save configuration for use by faculty.
- Dynamic form:
  - Add/Edit components with validations (max total weightage = 100%).

## Manage Faculty:

- **Page Details:**
  - Table displaying:
    - Faculty Name
    - Subjects Assigned
  - Actions:
    - Add Faculty: Form with fields for name, email, phone, and subject assignments.
    - Edit/Delete Faculty details.

## Manage Students:

- **Page Details:**
  - Tabs for:
    - Add Single Student: Form to enter details (Name, Roll Number, Batch, etc.).
    - Bulk Upload: Excel file upload for multiple students.
    - Verify/Approve Students: List of unverified profiles for approval.

## Generate Reports:

- **Page Details:**
  - Generate:
    - Department-level attendance reports.
    - Assessment performance reports.
    - Attainment reports (course-wise).

## 3. Faculty Module

### Faculty Dashboard:

- **Page Details:**
  - Overview cards for:
    - Subjects assigned
    - Attendance taken
    - Assessments conducted
  - Tabs for:

- View Assigned Subjects
- Configure Question Paper Patterns
- Manage Marks
- Take Attendance
- Freeze Marks
- Generate Reports
- Generate Final Course File

## **View Assigned Subjects:**

- **Page Details:**
  - List of subjects with:
    - Subject Name
    - Batch
    - Links to configure patterns or marks entry.

## **Configure Question Paper Patterns:**

- **Page Details:**
  - Dynamic form to create patterns:
    - Add questions with fields for:
      - Marks
      - CO, PO, TLO, BL mapping
    - Add optional questions and group them if needed.
    - Validate total marks (cannot exceed department-set max marks).
  - Save configuration for marks entry.

## **Manage Marks:**

- **Page Details:**
  - Workflow:
    1. Select Subject and Component (e.g., IA1, Assignment1).
    2. Display question paper pattern.
    3. Enter marks student-wise for each question.
    4. Save or finalize marks.

## **Freeze Marks:**

- **Page Details:**
  - Display marks entry status for all components (e.g., IA1, IA2, Assignment1).
  - Faculty confirms final marks and locks them for further editing.
  - Notify HOD and Exam Department about mark finalization.

## **Take Attendance:**



- **Page Details:**
  - Select subject and date.
  - Display list of students with checkboxes for marking presence.
  - Bulk actions (Mark all present/absent).
  - Save attendance.

## **Generate Reports:**

- **Page Details:**
  - Generate subject-level:
    - Attendance reports
    - Assessment reports
  - Export reports in Excel or PDF.

## **Generate Final Course File:**

- **Page Details:**
  - Workflow:
    1. Select Subject and Batch.
    2. Calculate attainment levels using:
      - Internal marks
      - Semester-end marks
      - Surveys
    3. Include:
      - Student performance
      - Mapping of COs to POs and attainment levels.
    4. Download NBA-compliant course file (PDF).

## **4. Student Module**

### **Student Dashboard:**

- **Page Details:**
  - Overview of:
    - Total attendance percentage
    - Marks obtained
  - Tabs for:
    - View Marks and Attendance

### **View Marks and Attendance:**

- **Page Details:**
  - Display subject-wise:
    - Marks for each component (IA1, IA2, etc.).
    - Attendance percentage.

## 5. Exam Department Module

### Exam Department Dashboard:

- **Page Details:**
  - Tabs for:
    - Generate Hall Tickets
    - Upload Semester-End Marks

### Generate Hall Tickets:

- **Page Details:**
  - Auto-generate hall tickets for eligible students:
    - Select department, batch, and semester.
    - Allow PDF printing for faculty use.

### Upload Semester-End Marks:

- **Page Details:**
  - Upload bulk marks using Excel:
    - Select subject and batch.
    - Validate and upload.

