Marks-Management System-User Guide & Documentation

1. Introduction

The **Marks Management System** is a web-based platform designed to automate and streamline the Outcome Based Education process for educational institutions. It allows institutions to define educational outcomes (POs, PSOs, COs), map them to courses, track student performance, and automatically calculate attainment levels.

Key Objectives

- **Digitize the Marks Process:** Move away from manual Excel sheets.
- **Automated Attainment Calculation:** Automatically compute Course Outcome (CO) and Program Outcome (PO) attainment based on marks and surveys.
- **Centralized Management:** Manage faculty, courses, and departments in one place.

2. System Architecture & Tech Stack

- **Frontend:** React.js (Vite), Material UI, Tailwind CSS.
- **State Management:** React Context API (AuthContext, SettingsContext).
- **Routing:** React Router DOM.
- **Mock Backend:** JSON Server (REST API).
- **Data Visualization:** Recharts (for attainment graphs).

3. Installation & Setup Guide

To run this application locally, follow these steps.

Prerequisites

- Node.js (v14 or higher) installed on your machine.

Step-by-Step Setup

1. **Clone/Download the Repository** containing the source code.
2. **Install Dependencies:** Open a terminal in the project root folder and run: **npm install**
3. **Install JSON Server** (if not already installed): **npm install json-server**
4. **Start the Mock Backend:** Open a terminal and run the server command to start the database on port 3001: **npm run server**
   (Note: Ensure db.json is present in the root directory).
5. **Start the React Application:** Open a **second** terminal window and run: **npm run dev**
6. **Access the App:** Open your browser and go to http://localhost:5173 (or the port shown in your terminal)

4. User Roles & Login

The system supports three distinct user roles:

1. **Super Admin:** Manages departments and institution-level admins.
2. **Admin (HOD):** Manages faculty, courses, curriculum, and department-level configurations.
3. **Faculty:** Manages course mapping, marks entry, and views attainment reports.

How to Login

- Navigate to the login page.
- You can use the **Quick Login** buttons provided for testing (Superadmin, Admin, Faculty).
- **Credentials (Sample):**
    - **Admin:** admin@obe.com (Dr. Alan Turing)
    - **Faculty:** faculty@obe.com (Prof. Ada Lovelace)

5. Super Admin User Guide

The **Super Admin** is the highest-level authority in the OBE Management System. This role is responsible for the structural setup of the institution, including creating departments and assigning Head of Departments (Admins).

A. Super Admin Dashboard

- **Access:** Log in as a Super Admin (e.g., superadmin@obe.com) and land on the Dashboard.
- **Overview:** View high-level statistics for the entire institution:
    - Total number of Departments.
    - Total Faculty count across all departments.
    - Total Courses running in the institution.

B. Manage Departments

This module allows you to define the academic structure of the institution.

- **Navigate to:** "Manage Departments" in the sidebar.
- **Add Department:**
    1. Click the **Add Department** button.
    2. Enter the Department Name (e.g., "Civil Engineering") and a unique ID (e.g., "D04").
    3. Click **Save**.
- **Edit/Delete:** Use the action buttons next to a department to rename it or remove it from the system.

C. Manage Admins (HODs)

Once departments are created, you must assign an Admin (Head of Department) to manage them.

- **Navigate to:** "Manage Admin" in the sidebar.
- **Add Admin:**
    1. Click **Add Admin**.
    2. Enter the **Name**, **Email**, and select the **Department** they belong to from the dropdown.
    3. The system assigns them the role of admin.
- **Role Scope:** This user will now have full access to manage faculty, courses, and configuration *only* for their assigned department.

D. Department Attainment Reports

Monitor the performance of different departments from a single view.

- **Navigate to:** "Department Attainment".
- **Select Department:** Use the dropdown to switch between departments (e.g., Computer Science, Electronics).
- **View Reports:**
    - **Consolidated Evaluation:** See how that specific department is performing against its POs/PSOs.
    - **Compare:** Use this to compare attainment levels across different branches of the institution.

6. Admin User Guide

The Admin (typically the Head of Department) is responsible for setting up the system for the semester.

Dashboard

- **Overview:** View live statistics on Total Faculty and Total Courses for your department.
- **Navigation:** Use the sidebar to access management modules.

A. Manage Faculty

1. Navigate to **Manage Faculty**.
2. **Add Faculty:** Click the "Add Faculty" button. Enter the Name and Email in the modal and click Save.
3. **Edit/Delete:** Use the action buttons in the table to update details or remove a faculty member.

B. Manage Courses

1. Navigate to **Manage Courses**.
2. **Add Course:** Click "Add Course". Enter the Course Code (e.g., CS301), Name, Semester, and Credits.
3. **Credits:** Ensure accurate credits are entered as they impact attainment weightage.

C. Assign Courses

1. Navigate to **Assign Courses**.
2. You will see a list of all courses.
3. Use the **dropdown menu** in the "Assigned Faculty" column to select a faculty member for each course.
4. Assignments are saved automatically (Auto-save enabled).

D. Manage Outcomes (POs & PSOs)

1. Navigate to **Manage Outcomes**.
2. **Program Outcomes (POs):** Define the standard 12 graduate attributes (PO1-PO12).
3. **Program Specific Outcomes (PSOs):** Define outcomes specific to your department (e.g., PSO1, PSO2).
4. **Edit:** Click on the description text to edit it inline. Changes save automatically when you click away.

E. System Configuration

1. Navigate to **Configuration**.
2. **Pass Threshold:** Set the minimum marks percentage a student needs to "attain" a CO (e.g., 50%).
3. **Attainment Levels:** Define thresholds for Level 1, 2, and 3 (e.g., 60%, 70%, 80% of students passing).
4. **Weightages:** Set the weightage for Direct (CIE+SEE) vs. Indirect (Surveys) attainment (e.g., 80/20).

F. Indirect Attainment (Surveys)

1. Navigate to **Indirect Attainment**.
2. Enter the average survey ratings (scale 1-3) collected from **Program Exit Surveys**, **Employer Surveys**, and **Alumni Surveys**.
3. Click **Save Changes** to persist the data.

7. Faculty User Guide

Faculty members are responsible for the academic data entry for their assigned courses.

A. Dashboard (Home)

Path: /faculty/dashboard The landing page provides a high-level summary of your academic activities.

- Key Metrics: View cards showing your Total Attainment, Direct vs. Indirect Attainment scores, and average CO Attainment levels across all your courses.
- My Assigned Courses: A list of courses currently assigned to you by the Head of Department (HOD).
- Quick Actions: Shortcut buttons to jump directly to "Enter Marks" or "Update Articulation" for your active courses.
- Performance Chart: A visual bar chart comparing the "Target" vs. "Attained" levels for your assigned courses.

B. Course Configuration (Setup)

Path: /faculty/configuration Action: *Do this first for every new course.* Before you can enter marks, you must define what you are teaching and how you will assess it.

- CO & Syllabus Definition (Tab 1):
    - Add CO: Click to create Course Outcomes (e.g., CO1, CO2).
    - Define: Enter the description, map it to syllabus modules, and assign a Bloom's Taxonomy Level (e.g., K1-Remember, K3-Apply).
    - Global Settings: Set the "Student Pass Threshold" (e.g., 50% marks needed to pass).
- Assessment & Scaling Plan (Tab 2):
    - Add Tool: Create assessment tools like "Internal Assessment 1", "Assignment 1", etc..
    - Map Marks: Define the total marks for the tool (e.g., 30 marks) and how many marks are allocated to each CO (e.g., 15 marks for CO1, 15 marks for CO2).
    - Weightage: Set how much this tool contributes to the final internal grade.

C. Articulation Matrix (Mapping)

Path: /faculty/articulation Action: *Map your course to the Program.* This page establishes the relationship between your Course Outcomes (COs) and the department's Program Outcomes (POs).

- Select Course: Choose the course you want to map.
- Enter Correlation: For each CO row, enter a value (1, 2, or 3) under the relevant PO/PSO columns:
    - 1: Low Correlation

    - 2: Medium Correlation
    - 3: High Correlation
    - - (Empty): No Correlation
- AI Generate: You can upload your syllabus document to auto-generate a draft matrix using AI.
- Save: Commits the mapping to the database.

D. Marks Entry

Path: /faculty/marks Action: *Enter student performance data.*

- Selection: Choose the Course and the Assessment (e.g., Internal Assessment 1) you configured earlier.
- Input Data: The table lists all students assigned to the course. Enter marks for each Question/CO column.
    - *Example:* If "Q1" tests "CO1" for 10 marks, enter the student's score out of 10.
- Validation: The system prevents you from entering marks higher than the maximum allocated for that question.
- Edit/Lock: Click the pencil icon to edit a specific row; click save to lock it.

E. Indirect CO Attainment

Path: /faculty/indirect-co Action: *Capture student feedback.* This page records the "Course End Survey" results, which contributes to the indirect attainment calculation.

- Survey Input: Enter the average student rating (scale 1-3) for each Course Outcome based on feedback collected at the end of the semester.
- Calculation: These ratings are used to calculate the "Indirect Attainment" score for the course.

F. CO-PO Attainment (Calculation View)

Path: /faculty/copo-attainment Action: *Verify detailed calculations.* This provides a detailed, Excel-like view of how attainment is being calculated for every student.

- Detailed Table: View a breakdown of every student's performance across all assessments (IA1, IA2, Assignment, SEE).
- Threshold Check: The system highlights whether a student "Attained" the target (Y/N) for each CO based on the threshold set in Configuration.
- Final Attainment: View the final calculated CO Attainment Levels (0-3) and the resulting PO Attainment values based on the articulation matrix averages.

G. Reports (Analytics)

Path: /faculty/AttainmentReportPage Action: *View final visual reports.* This is the summary page you would typically print or present.

- CO Attainment Graph: A bar chart comparing the "Target Level" vs. "Attained Level" for each CO.
- PO Attainment Graph: A chart showing how well this specific course contributed to the overall Program Outcomes.
- Consolidated Card: A final summary card showing the Total Attainment Score, combining Direct (exams) and Indirect (surveys) components.

8. Calculations & Logic

The system uses the following logic for calculations:

- **CO Attainment (Direct):** Calculated based on the percentage of students scoring above the *Pass Threshold* in Internal Assessments (CIE) and Semester End Exams (SEE).
- **Attainment Levels (0-3):**
  - Level 1: > 50% students passed.
  - Level 2: > 60% students passed.
  - Level 3: > 70% students passed.
- **PO Attainment (Direct):** Average of CO attainment levels for COs mapped to a specific PO.
- **Final Attainment:** (Direct Attainment * 0.8) + (Indirect Attainment * 0.2).

9. Troubleshooting

- **Data not saving?** Ensure the npm run server terminal is running and db.json is writable.
- **Dropdown empty?** Ensure you have added Faculty/Courses in the Admin panel first.
- **Login failing?** Check db.json for valid user emails and ensure the role matches.