

**“UniMate University”**  
**Requirement Analysis - MVP Project**  
**MERN Stack MVP Web Application**

**1. Functional Requirements:**

**a. Authentication:**

**i. Student:**

1. Can log in and log out securely.
2. Can update their password.

**ii. Faculty:**

1. Can log in and log out securely.
2. Can update their password.

**iii. Admin:**

1. Can log in and log out securely.
2. Can update their password.

**b. Profile Management:**

**i. Student:**

1. Can manage and update their profile information.
2. Can update certain fields only.

**ii. Faculty:**

1. Can manage and update their profile information.
2. Can update certain fields only.

**iii. Admin:**

1. Can manage and update their profile information.
2. Can update certain fields only.

**c. Academic Procedures:**

**i. Student:**

1. Can enrol in the offered courses for a specific semester.
2. Can view their class schedule.
3. Can view their grades and results.
4. Can view notice boards and events.

**ii. Faculty:**

1. Can manage students' grades.
2. Can access students' personal and academic information.

**iii. Admin:**

**1. Can manage multiple processes:**

- a. Semesters;
- b. Courses;
- c. Offered Courses;
- d. Sections;
- e. Rooms;
- f. Buildings;

**d. User Management:**

**i. Admin:**

1. Can manage multiple types of users.
2. Can block/unblock users.
3. Can change users' passwords.

## 2. Data Model:

| Academic Faculty   |  | Academic Department  |   |
|--|--|--|---|
| <ul style="list-style-type: none"> <li>• _id</li> <li>• name</li> <li>• createdAt</li> <li>• updatedAt</li> </ul>  |  | <ul style="list-style-type: none"> <li>• _id</li> <li>• name</li> <li>• academicFaculty</li> <li>• createdAt</li> <li>• updatedAt</li> </ul>   |   |
| Management Department  |  | Course   |   |
| <ul style="list-style-type: none"> <li>• _id</li> <li>• name</li> <li>• createdAt</li> <li>• updatedAt</li> </ul>  |  | <ul style="list-style-type: none"> <li>• _id</li> <li>• title</li> <li>• prefix</li> <li>• code</li> <li>• credits</li> <li>• prerequisiteCourse: <ul style="list-style-type: none"> <li>◦ course</li> <li>◦ isDeleted</li> </ul> </li> <li>• isDeleted</li> <li>• createdAt</li> <li>• updatedAt</li> </ul> |   |
| Academic Semester  |  | Semester Registration  |   |
| <ul style="list-style-type: none"> <li>• _id</li> <li>• name</li> <li>• year</li> <li>• code</li> <li>• startMonth</li> <li>• endMonth</li> <li>• createdAt</li> <li>• updatedAt</li> </ul>  |  | Client Model   | Database Model  |
|  |  | <ul style="list-style-type: none"> <li>• academicSemester</li> <li>• startDay</li> <li>• endDay</li> <li>• startTime</li> <li>• endTime</li> <li>• minCredit</li> <li>• maxCredit</li> </ul>   | <ul style="list-style-type: none"> <li>• _id</li> <li>• academicSemester</li> <li>• status</li> <li>• startDate</li> <li>• endDate</li> <li>• minCredit</li> <li>• maxCredit</li> <li>• createdAt</li> <li>• updatedAt</li> </ul> |
| Offered Course   |  | User   |   |
| Client Model   | Database Model   | <ul style="list-style-type: none"> <li>• _id</li> <li>• id (generated)</li> <li>• password</li> <li>• needsPasswordChange</li> <li>• role</li> <li>• status</li> <li>• createdAt</li> <li>• updatedAt</li> <li>• isDeleted</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>• _id</li> <li>• semesterRegistration</li> <li>• academicSemester</li> <li>• academicFaculty</li> <li>• academicDepartment</li> <li>• course</li> <li>• faculty</li> <li>• maxCapacity</li> <li>• remainingCapacity</li> <li>• section</li> <li>• days</li> <li>• startTime</li> <li>• endTime</li> <li>• createdAt</li> <li>• updatedAt</li> </ul> | <ul style="list-style-type: none"> <li>• semesterRegistration</li> <li>• academicDepartment</li> <li>• course</li> <li>• faculty</li> <li>• maxCapacity</li> <li>• remainingCapacity</li> <li>• section</li> <li>• days</li> <li>• timeSlot</li> </ul> |  |   |

| Student   | Faculty   |
|---|---|
| <ul style="list-style-type: none"> <li>• <code>_id</code></li> <li>• <code>id</code> (generated)</li> <li>• <code>user</code></li> <li>• <code>name</code> <ul style="list-style-type: none"> <li>◦ <code>firstName</code></li> <li>◦ <code>middleName</code></li> <li>◦ <code>lastName</code></li> </ul> </li> <li>• <code>gender</code></li> <li>• <code>dateOfBirth</code></li> <li>• <code>email</code></li> <li>• <code>contactNo</code></li> <li>• <code>emergencyContactNo</code></li> <li>• <code>bloodGroup</code></li> <li>• <code>presentAddress</code></li> <li>• <code>permanentAddress</code></li> <li>• <code>guardian</code> <ul style="list-style-type: none"> <li>◦ <code>father</code> <ul style="list-style-type: none"> <li>■ <code>name</code> <ul style="list-style-type: none"> <li>• <code>firstName</code></li> <li>• <code>middleName</code></li> <li>• <code>lastName</code></li> </ul> </li> <li>■ <code>occupation</code></li> <li>■ <code>contactNo</code></li> <li>■ <code>email</code></li> </ul> </li> <li>◦ <code>mother</code> <ul style="list-style-type: none"> <li>■ <code>name</code> <ul style="list-style-type: none"> <li>• <code>firstName</code></li> <li>• <code>middleName</code></li> <li>• <code>lastName</code></li> </ul> </li> <li>■ <code>occupation</code></li> <li>■ <code>contactNo</code></li> <li>■ <code>email</code></li> </ul> </li> </ul> </li> <li>• <code>localGuardian</code> <ul style="list-style-type: none"> <li>◦ <code>name</code> <ul style="list-style-type: none"> <li>■ <code>firstName</code></li> <li>■ <code>middleName</code></li> <li>■ <code>lastName</code></li> </ul> </li> <li>◦ <code>occupation</code></li> <li>◦ <code>contact No</code></li> <li>◦ <code>email</code></li> <li>◦ <code>address</code></li> <li>◦ <code>relationship</code></li> </ul> </li> <li>• <code>profileImage</code></li> <li>• <code>admissionSemester</code></li> <li>• <code>nationality</code></li> <li>• <code>Religion</code></li> <li>• <code>isDeleted</code></li> </ul> | <ul style="list-style-type: none"> <li>• <code>_id</code></li> <li>• <code>id</code> (generated)</li> <li>• <code>user</code></li> <li>• <code>designation</code></li> <li>• <code>name</code> <ul style="list-style-type: none"> <li>◦ <code>firstName</code></li> <li>◦ <code>middleName</code></li> <li>◦ <code>lastName</code></li> </ul> </li> <li>• <code>gender</code></li> <li>• <code>dateOfBirth</code></li> <li>• <code>email</code></li> <li>• <code>contactNo</code></li> <li>• <code>emergencyContactNo</code></li> <li>• <code>bloodGroup</code></li> <li>• <code>presentAddress</code></li> <li>• <code>permanentAddress</code></li> <li>• <code>profileImage</code></li> <li>• <code>academicDepartment</code></li> <li>• <code>joiningDate</code></li> <li>• <code>nationality</code></li> <li>• <code>religion</code></li> <li>• <code>isDeleted</code></li> </ul>   |
|   | Admin   |
|   | <ul style="list-style-type: none"> <li>• <code>_id</code></li> <li>• <code>id</code> (generated)</li> <li>• <code>user</code></li> <li>• <code>designation</code></li> <li>• <code>name</code> <ul style="list-style-type: none"> <li>◦ <code>firstName</code></li> <li>◦ <code>middleName</code></li> <li>◦ <code>lastName</code></li> </ul> </li> <li>• <code>gender</code></li> <li>• <code>dateOfBirth</code></li> <li>• <code>email</code></li> <li>• <code>contactNo</code></li> <li>• <code>emergencyContactNo</code></li> <li>• <code>bloodGroup</code></li> <li>• <code>presentAddress</code></li> <li>• <code>permanentAddress</code></li> <li>• <code>profileImage</code></li> <li>• <code>managementDepartment</code></li> <li>• <code>joiningDate</code></li> <li>• <code>nationality</code></li> <li>• <code>religion</code></li> <li>• <code>isDeleted</code></li> </ul> |

### 3. API Endpoints and CRUD Operation Methods:

Most **GET** endpoints (especially those returning lists like students, faculties, departments, courses, etc.) support:

- **searchTerm=<keyword>**: for partial name/code/id searches
- **limit=<number>**: to limit results per page
- **page=<keyword>**: to paginate results
- **sort=<field>**: for sorting
- **Field-based filters**: (e.g., gender=male&bloodGroup=B+)

#### a. Academic Faculty:

- Create an academic faculty**: academic-faculties/create-academic-faculty (**POST**)
- Get all academic faculties**: academic-faculties (**GET**)
- Get a specific academic faculty**: academic-faculties/:id (**GET**)
- Update a specific academic faculty**: academic-faculties/:id/: (**PATCH**)

#### b. Academic Department:

- Create an academic department**:  
academic-departments/create-academic-department (**POST**)
- Get all academic departments**: academic-departments (**GET**)
- Get a specific academic department**: academic-departments/:id (**GET**)
- Update a specific academic department**: academic-departments/:id (**PATCH**)

#### c. Management Department:

- Create a management department**:  
management-departments/create-management-department (**POST**)
- Get all management departments**: management-departments (**GET**)
- Get a specific management department**: management-departments/:id (**GET**)
- Update a specific management department**:  
management-departments/:id (**PATCH**)

#### d. Course:

- Create a course**: courses/create-course(**POST**)
- Get all courses**: courses(**GET**)
- Get a specific course**: courses/:id (**GET**)
- Update a specific course**: courses/:id (**PATCH**)
- Delete a course**: courses/:id (**DELETE**)
- Get all assigned faculties of a course**: courses/faculties/:id (**GET**)
- Assign faculties to a course**: courses/:id/assign-faculties (**PUT**)
- Remove faculties from a course**: courses/:id/remove-faculties (**DELETE**)

#### e. Academic Semester:

- Create an academic semester**:  
academic-semesters/create-academic-semester (**POST**)

- ii. **Get all academic semesters:** academic-semesters (**GET**)
- iii. **Get a specific academic semester:** academic-semesters/:id (**GET**)
- iv. **Update a specific academic semester:** academic-semesters/:id (**PATCH**)

**f. Semester Registration:**

- i. **Create a semester registration:**  
semester-registrations/create-semester-registration (**POST**)
- ii. **Get all semester registrations:** semester-registrations (**GET**)
- iii. **Get a specific semester registration:** semester-registrations/:id (**GET**)
- iv. **Update a specific semester registration:** semester-registrations/:id (**PATCH**)
- v. **Update all semester registration statuses:**  
semester-registrations/update/status (**PATCH**)

**g. Offered Course:**

- i. **Create an offered course:**  
offered-courses/create-offered-course (**POST**)
- ii. **Get all offered courses:** offered-courses (**GET**)
- iii. **Get a specific offered course:** offered-courses/:id (**GET**)
- iv. **Update a specific offered course:** offered-courses/:id (**PATCH**)

**h. User:**

- i. **Create different types of users:**
  - 1. **Student:** users/create-student (**POST**)
  - 2. **Faculty:** users/create-faculty (**POST**)
  - 3. **Admin:** users/create-admin (**POST**)

**i. Student:**

- i. **Get all students:** students (**GET**)
- ii. **Get a specific student:** students/:id (**GET**)
- iii. **Update a specific student:** students/:id (**PATCH**)
- iv. **Delete a specific student:** students/:id (**DELETE**)
- v. **Get students' profile:** students/my-profile (**GET**)

**j. Faculty:**

- i. **Get all faculties:** faculties (**GET**)
- ii. **Get a specific faculty:** faculties/:id (**GET**)
- iii. **Update a specific faculty:** faculties/:id (**PATCH**)
- iv. **Delete a specific faculty:** faculties/:id (**DELETE**)
- v. **Get faculties' profile:** faculties/my-profile (**GET**)

**k. Admin:**

- i. **Get all admins:** admins (**GET**)
- ii. **Get a specific admin:** admins/:id (**GET**)
- iii. **Update a specific admin:** admins/:id (**PATCH**)

- iv. **Delete a specific admin:** admins/:id (**DELETE**)
- v. **Get admins' profile:** admins/my-profile (**GET**)

**I. Auth:**

- i. **Login:** auth/login
- ii. **Register:** auth/register
- iii. **Refresh Token:** auth/refresh-token
- iv. **Change Password:** auth/change-password
- v. **Forgot Password:** auth/forgot-password
- vi. **Reset Password:** auth/reset-password