



# **COMSATS UNIVERSITY ISLAMABAD VEHARI CAMPUS**

**Submitted by:**

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**Roll no:**

FA22-BSE-031

**Submitted to:**

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**Course:**

Advance Web  
Technologies

**Project**

**Name:**

CVUR Portal

offerings reviews and course  
recommendation portal

# Review App — REST API Design & Implementation Report

## A. Design (8 marks)

### 1. Problem statement & Requirements

This project implements a course review platform for CUI Vehari students. The goal is to let enrolled students securely submit anonymous course evaluations for specific "offerings" (course + teacher + section + term), allow limited editing, and provide admin tools to manage academic terms and the set of offerings. The API is implemented with Express and MongoDB (Mongoose).

#### Primary goals

- Secure student onboarding using CUI Vehari email verification (OTP) and allow users to complete a minimal profile required to participate.
- Allow students to submit one anonymous rating per offering. Ratings must include an overall rating (1-5) and obtained marks; optional free-text comments are supported.
- Provide admin capabilities to manage Terms and Offerings: create, update, delete, activate (promote) terms and to bulk import offerings from XLSX file.
- Generate and store aggregated rating summaries for closed terms during promotion so historical summaries are available without heavy runtime computation.

#### Important functional requirements

- Signup requires a CUI Vehari student email in the format `^([fa|sp] (\d{2})-([az]{2,4})-(\d{3})@cuivehari\.edu\.pk$)`. The controller enforces this and computes the user's intake and a derived `semesterNumber` from the email and current date.
- Signup uses a 6-digit OTP (stored hashed in `VerificationToken`) that expires in 15 minutes; verification activates the user account.
- Login returns a JWT and sets an `HttpOnly` cookie; `/api/auth/me` returns the populated user (department/program auto-resolved via an email->program map when missing).
- Profile completion supports uploading an ID card image (`express-fileupload`). Only images (png/jpg/gif/webp) up to 1MB are accepted; after completion `profileComplete` is set to true.
- Ratings: `POST /ratings` requires `offering`, `overallRating` (1-5), and `obtainedMarks`. Ratings are enforced anonymous server-side (`anonymized = true`), and a unique index prevents more than one rating per student+offering.

- Edit rules: students can only update their own rating and only within the term activation time edit window (controller checks creation date). Editing is closed when the offering's term is no longer active (term is promoted by admin).
- Admin routes are protected by `adminAuth/adminRequire`.  
`/admin/terms/:id/promote` activates the selected term, optionally sets start/end dates, creates the subsequent term, and generates stored rating summaries for the previously active term.
- Offerings upload supports parsing XLSX (ExcelJS) to create Courses, Teachers, Offerings and Departments/Programs. The XLSX uploader accepts common header names (code, title, teacher, department, program, semesterNumber, section) and does in-file dedupe before DB writes.
- Offerings have a unique index on `{ course, teacher, term, section }` to avoid duplicates. Deletion endpoints return JSON for API clients and redirect for HTML form flows.
- Error handling: controllers return a consistent JSON envelope `{ success: true|false, data:..., error:... }` and proper HTTP status codes (400/401/403/404/409/500) according to the failure type.

## 2. Screen Shots:

The screenshot displays the CVUR Portal homepage with a dark theme. At the top, there's a navigation bar with a logo, "CVUR PORTAL SEE CLEARLY, CHOOSE WISELY", and links for "Home", "Sign Up", "Login", and "Admin".

The main content area features a large banner with the CVUR logo and the tagline "COMSATS VEHARI • UNOFFICIAL REVIEWS". Below this, a section titled "Make smarter course choices with real student ratings." includes a brief description of the portal's purpose and a yellow "Get Started" button.

A "Rating preview" card for "Software Engineering (CSE-302)" by Dr. Hasan (b7) shows a rating of 4.1 overall (67) with a moderate workload. It includes a summary: "Good explanations, but lots of assignments. Midterm grading is strict.", and details: "27 reviews" and "Fall 2024".

The "Why students use CVUR" section highlights three reasons: "Real student feedback", "Know difficulty & workload", and "Anonymous but constructive".

The "How it works" section provides a 3-step guide: Step 1 (Sign up), Step 2 (Complete profile and review courses), and Step 3 (Use summaries and trends). It also includes "Create Account" and "Student Login" buttons.

The "About CVUR" section explains that CVUR is a side project built for COMSATS Vehari students, not an official product, but aims to complement academic advising. It notes that ratings are stored per term and summarized at the end of each term.

The "Contact the developer" section encourages users to share suggestions and bugs. It lists social media links for GitHub, LinkedIn, and Email, along with a note that the project is built with React, Express, and MongoDB.

At the bottom, a footer bar contains the copyright notice "© 2026 CVUR Portal — COMSATS Vehari unofficial review portal", the tagline "See clearly, choose wisely", and links for "Built for CSC337" and "Home".

 **CVUR PORTAL**  
SEE CLEARLY, CHOOSE WISELY

Home Sign Up Login Admin

### Sign Up

Use your CUI Vehari email in the format fa22-bse-031@cuivehari.edu.pk.

Name

Email  


Password

Confirm Password

**Create Account**

Already have an account? [Log In](#)

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 **CVUR PORTAL**  
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Home Sign Up Login Admin

### Login

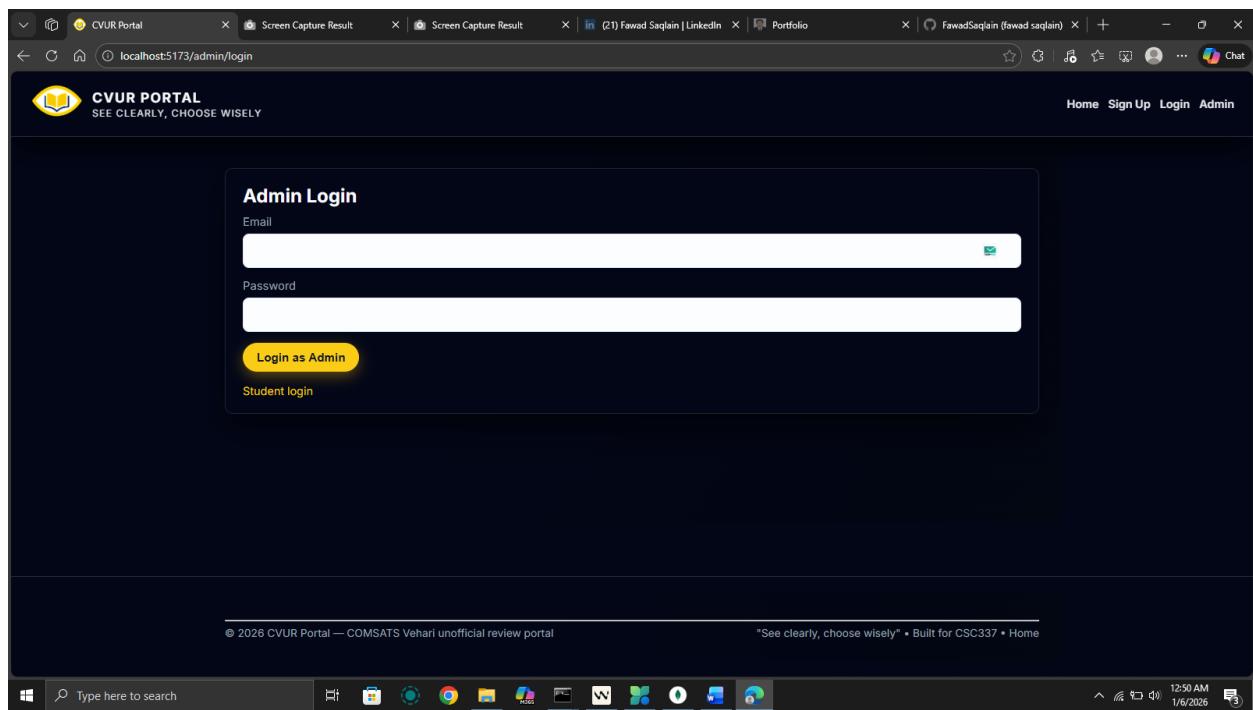
Email  


Password

**Login**

[Create an account](#) [Forgot password?](#)

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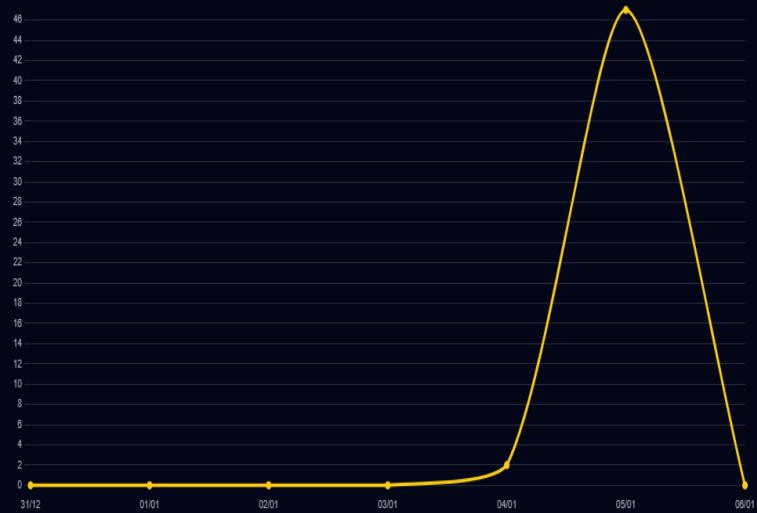
# Admin Analytics Dashboard

High-level overview of how CVUR Portal is being used in real time: student accounts, ratings activity, and academic data for current and past terms.



## Ratings over last 7 days

Line chart of daily ratings submitted. This helps you see recent engagement trends.



## Activity snapshot

Relative activity across key areas. Each tile shows the total and a range line scaled to the busiest area.



## **View Ratings Summaries**

CVUR Portal | (21) Fawad Saqlain | LinkedIn | Portfolio | FawadSaqlain (fawad saqlain)

localhost:5173/admin/ratings

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Admin Dashboard View Ratings Terms Manage Offerings Manage Users Admin Logout

## Admin • Ratings

Summary-only view for inactive terms. Active-term ratings are not displayed.

Search

Search by course, teacher, or term

### Results

- CSC-087 - HCI — Sidra — sp27**  
1 review Avg marks: 73.00 Updated: 1/6/2026, 12:29:20 AM 3.00 / 5  
 No comments available.
- BTY-746 - Genetics — Hamza Khan — fa25**  
1 review Avg marks: 10.00 Updated: 1/6/2026, 12:28:16 AM 3.00 / 5  
 No comments available.
- BTY-724 - Genetic Engineering — Hiba Akhtar — fa25**  
1 review Avg marks: 98.00 Updated: 1/6/2026, 12:28:16 AM 4.00 / 5  
 No comments available.

Type here to search

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## Admin Terms

Note: Terms must have Start and End dates before they can be activated. To create new terms, use the admin API or add via the database.

Season: FA Year: e.g. 25

Start Date: mm/dd/yyyy End Date: mm/dd/yyyy

Create Term

### Existing Terms

Name	Start Date	End Date	Active	Actions
<b>sp28</b> <small>ID: 694d5f53dd7dfbec5043401c</small>	mm/dd/yyyy	mm/dd/yyyy	No	Promote & Create Next
<b>sp24</b> <small>ID: 695d31e7d95a0783448078f6</small>	mm/dd/yyyy	mm/dd/yyyy	No	Promote & Create Next
<b>fa27</b> <small>ID: 694d5d67dd7dfbec50433ef1</small>	2025-12-10	2025-12-27	Yes	
<b>sp27</b> <small>ID: 694d5cc6dd7dfbec50433b99</small>	2027-02-28	2027-06-25	No	Activate
<b>sp26</b> <small>ID: 694d21e2585832ebbeb51668</small>	2025-12-01	2026-01-31	No	Activate
<b>fa26</b> <small>ID: 694d5cbadd7dfbec50433b8a</small>	2025-12-27	2025-12-15	No	Activate
<b>fa25</b> <small>ID: 694d1d22585832ebbeb51667</small>	2025-08-01	2025-12-31	No	Activate
<b>sp23</b> <small>ID: 694d6947dd7dfbec5043403a</small>	2025-12-03	2025-12-30	No	Activate
<b>fa23</b> <small>ID: 694d9b6a7bfd2257d062001</small>	2026-01-14	2026-04-30	No	Activate
<b>fa22</b> <small>ID: 694d692add7dfbec5043402b</small>	2025-12-03	2025-12-31	No	Activate

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Admin Dashboard View Ratings Terms Manage Offerings Manage Users Admin Logout

## Offerings by Term

Term: fa22

Filter + Add Class / Bulk Upload

Code	Title	Teacher	Dept	Program	Sem	Section	Term	Actions
CS-101	Introduction to Computer Science	Jane Doe	Computer Science	Bachelor of Science in Computer Science	1	A	fa22	
CS-102	Data Structures	John Smith	Computer Science	Bachelor of Science in Computer Science	2	A	fa22	
CS-201	Algorithms	Emily Khan	Computer Science	Bachelor of Science in Computer Science	3	B	fa22	
HCI-101	Human Computer Interaction	Sidra Ali	Computer Science	Bachelor of Science in Computer Science	3	B	fa22	
SPM-101	Software Project Management	Ayesha Khan	Computer Science	Bachelor of Software Engineering	5	B	fa22	
BAF-110	Auditing	Usman Malik	Management Sciences	Bachelor of Accounting and Finance	1	A	fa22	
BAF-111	Managerial Accounting	Ali Ahmed	Management Sciences	Bachelor of Accounting and Finance	1	B	fa22	

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Admin Dashboard View Ratings Terms Manage Offerings Manage Users Admin Logout

## Admin b7 Add Class Manually

Department  
-- Select Department --

Program / Degree  
-- Select Program --

Semester Number

Section (optional)

Subjects

Course Code	Course Title	Teacher Name
<input type="button" value="Add subject"/>		
<input type="button" value="Add Class(es)"/>		

Or upload .xlsx (bulk)

Choose .xlsx file  
 No file chosen

Term (optional)  
fa27 (active)

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The screenshot shows the Admin Dashboard of the CVUR Portal. At the top, there is a navigation bar with links: Admin Dashboard, View Ratings, Terms, Manage Offerings, Manage Users, and Admin Logout. Below the navigation bar, the main content area has a title "Student Users". There is a yellow button labeled "Create new student". A search bar contains the placeholder "Search by email or name" and a magnifying glass icon. Below the search bar is a "Search" button. A table lists student users with columns: Email, Name, Role, Active, Degree, Roll #, Semester, Section, and Actions. The table contains five rows of data. At the bottom of the table, there are buttons for "Previous", "Page 1", and "Next". A message "Total users: 5" is displayed below the table.

Email	Name	Role	Active	Degree	Roll #	Semester	Section	Actions
fa21-bse-031@cuivehari.edu.pk	aslam	student	No	bse	031	9	-	
fa22-bse-002@cuivehari.edu.pk	Fawad Saqlain	student	Yes	bse	002	7	-	
fa22-bse-021@cuivehari.edu.pk	Hamza Iqbal	student	No	bse	021	7	-	
fa22-bse-031@cuivehari.edu.pk	Fawad	student	Yes	bse	031	7	B	
fa22-bse-118@cuivehari.edu.pk	All Raza	student	Yes	bse	118	7	B	

The screenshot shows a browser window with multiple tabs open. The active tab is titled "Verify Signup (OTP)" and has the URL "localhost:5173/verify-signup?email=fa25-bse-031%40cuivehari.edu.pk". The page itself has a title "Verify Signup (OTP)". It contains two input fields: "Email" with the value "fa25-bse-031@cuivehari.edu.pk" and "OTP". Below the OTP field is a large empty text area. At the bottom of the form are two buttons: "Verify" and "Resend OTP". A "Back to Login" link is also present. The browser's address bar shows the full URL and the tab title "FawadSaqlain (fawad saqlain)". The status bar at the bottom of the screen shows the date and time as "1/6/2026 1:47 AM".

The screenshot shows a Microsoft Edge browser window with multiple tabs open. The active tab is titled 'localhost:5173/complete-profile'. The page has a dark blue header with the 'CVUR PORTAL' logo and the tagline 'SEE CLEARLY, CHOOSE WISELY'. On the right side of the header are links for 'My Profile', 'Give Review', 'View Ratings', 'My Reviews', and 'Logout'. Below the header is a large form titled 'Complete Profile' with the sub-instruction 'Add section, phone and (if applicable) CGPA. You can also upload your university ID card.' It contains fields for 'Section' (with placeholder 'e.g., A'), 'Phone' (with placeholder 'e.g., 03xx-xxxxxxx'), and a file input for 'University ID Card (image, max 1MB)' which shows 'Choose File | No file chosen'. At the bottom of the form is a yellow 'Save Profile' button.

The screenshot shows a Microsoft Edge browser window with a dark blue header. The header includes the 'CVUR PORTAL' logo, the tagline 'SEE CLEARLY, CHOOSE WISELY', and links for 'My Profile', 'Give Review', 'View Ratings', 'My Reviews', and 'Logout'. Below the header is a 'My Profile' section with a sub-instruction 'Your verified student details for CVUR Portal'. This section displays various student details in a grid format:

EMAIL	NAME
fa22-bse-031@cuivehari.edu.pk	Fawad
DEPARTMENT	PROGRAM
Computer Science	Software Engineering
INTAKE	SEMESTER
fa2022	7
SECTION	CGPA
B	3.43
PHONE	
+923228730277	

Below this grid is a section for 'UNIVERSITY ID (UPLOADED)' with a placeholder image.

At the bottom of the page, there is a footer with the text '© 2026 CVUR Portal — COMSATS Vehari unofficial review portal' and 'See clearly, choose wisely' • Built for CSC337 • Home'.

The screenshot shows a web browser window with three tabs open: 'CVUR Portal', '(2) Fawad Saqlain | LinkedIn', and 'Portfolio'. The main content area displays a table titled 'My Ratings' with 15 rows of data. The columns are 'Offering (Teacher — Course)', 'Overall', 'Marks', 'Comment', 'Submitted', and 'Actions'. Each row contains a link icon in the 'Actions' column.

Offering (Teacher — Course)	Overall	Marks	Comment	Submitted	Actions
Hamza Khan — BTY-746 - Genetics	4	40		1/5/2026, 4:39:11 PM	
Hiba Akhtar — BTY-724 - Genetic Engineering	4	50		1/5/2026, 4:39:05 PM	
Amina Anwar — BSM-746 - Abstract Algebra	4	80		1/5/2026, 4:39:00 PM	
Imran Malik — BSM-724 - Calculus II	3	40		1/5/2026, 4:38:56 PM	
Sana Butt — BSE-746 - Requirements Engineering	5	37		1/5/2026, 4:38:51 PM	
Hassan Sheikh — BSE-724 - DevOps Practices	5	90		1/5/2026, 4:38:27 PM	
Ayesha Javed — BMD-746 - Linear Algebra	3	49		1/5/2026, 4:38:17 PM	
Sara Butt — BMD-724 - Probability and Statistics	5	50		1/5/2026, 4:38:11 PM	
Sara Tariq — BES-746 - Introduction to Environmental Science	5	80		1/5/2026, 4:38:05 PM	
Usman Saleem — BES-724 - Environmental Geology	5	59		1/5/2026, 4:37:59 PM	
Amina Yousaf — BEN-746 - Microprocessors and Interfacing	5	78		1/5/2026, 4:37:51 PM	
Imran Akhtar — BEN-724 - Data Communication	5	16		1/5/2026, 4:37:37 PM	
Sara Raza — BED-746 - Assessment and Evaluation	5	80		1/5/2026, 4:37:14 PM	
Zain Sheikh — BED-724 - Educational Technology	3	90		1/5/2026, 4:37:08 PM	

The screenshot shows a web browser window with three tabs open: 'CVUR Portal', '(2) Fawad Saqlain | LinkedIn', and 'FawadSaqlain (fawad saqlain)'. The main content area displays a table titled 'Give Reviews' with 15 rows of data. Each row contains a course offering, its teacher, and section, followed by a 'Give Review' button.

Term: sp27 (active)		
Auditing	by Amna (Section B)	
Financial Reporting	by Noor (Section B)	
Remote Sensing and GIS	by Imran (Section B)	
Environmental Microbiology	by Noor (Section B)	
Business Research Methods	by Usman (Section B)	
Business Communication	by Omar (Section B)	
Introduction to Computer Science	by Maryam (Section B)	
Software Construction	by Hiba (Section B)	
Mathematics for Economists	by Sana (Section B)	
Statistics for Economists	by Maryam (Section B)	
Educational Technology	by Zain (Section B)	
Assessment and Evaluation	by Sara (Section B)	
Total Courses: 15		



CVUR PORTAL  
SEE CLEARLY, CHOOSE WISELY

[My Profile](#) [Give Review](#) [View Ratings](#) [My Reviews](#) [Logout](#)

### ★ Give Review

Auditing — Amna Anwar (Section B)

Overall Rating (1-5)

★★★★★

Obtained Marks

98

Comment (optional)

great

[Submit Review](#)

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### 3. Resource model & URIs

Primary resources with example URIs (derived from project):

Resource	URI	Purpose
User	/api/auth/login, /api/auth/me	Login, profile, complete profile
Rating	/ratings (POST), /ratings/:id (PUT/GET)	Create, update, view ratings
Offering	/admin/offerings (GET), /admin/offerings/:id (DELETE/PUT)	Admin manage offerings
Term	/admin/terms, /admin/terms/:id/promote	Manage academic terms and promotion

Public ratings API	/api/ratings, /api/ratings/summary	Public summary data and mobile API
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#### 4. HTTP Methods & Status Codes

#### 5. JSON Structure & Schema

### B. Implementation (14 marks)

1. Project structure & code quality

2. Endpoints (CRUD)

3. Validation & Error Handling

4. Authentication / Security

5. Database Integration

6. Documentation & Testing

Requests through Postman

Observed Postman tests (actual requests & responses ran)