Department of Software Engineering

OUTCOME BASED EDUCATION (OBE) V2.0

Department of Software Engineering

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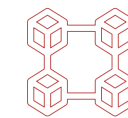
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Member - **21SW43**

Introducti

OBE by PEC

➢ OBE ensures students gain knowledge and demonstrate specific skills.

➢ Aligns educational goals with industry standards.

➢ Evaluates performance through continuous assessment.

➢ Focuses on Program Learning Outcomes (PLOs) and Course Learning Outcomes (CLOs).

➢ Emphasizes competencies, not just exams.

V2.0? What is new?

• This project is a continuation of the previous project by 20SW Batch, led by Abdullah. Our work is to fine-tune the previous project, bring it to working condition, and then add the three missing components to the system.

• Those three components will be CQI, Reporting, and Surveys. If necessary, some changes to the existing design, components, and system will be made.

• **SDGs:**

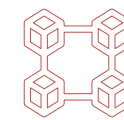• Industry, Innovation and infrastructure

Problems Statement

➢The existing OBE system is costly due to its monthly subscription model.

➢Only limited accounts are available, which are insufficient for students, leaving them without access.

➢There is a need for a personal and scalable solution that allows both faculty and students to engage with the OBE system.

Aim &

Aim

- To develop a scalable and personal Outcome Based Education system that provides both students and faculties, while incorporating essential features like Continuous Quality Improvement (CQI), semester CGPA and CLO, PLO reports.

Objectives

- Fine tune the existing OBE project and bring it to the working condition.

- Integrate CQI functionality to address student performance gaps when CLOs are not achieved.

- Develop a detailed reporting system that generates GPA, CGPA, and CLO/PLO mark sheets.

- Implement a survey module to gather feedback from students, for teachers' performances and learning experiences.

- Provide unlimited accounts for both students and faculty, eliminating access limitations.

Methodolog

➢ Examine the current OBE system's limitations, emphasizing React frontend, Node.js backend, and Microsoft SQL Server database.

➢ Collect requirements from faculty and students to structure the database schema and API endpoints in Node.js.

➢ Enhance the existing project using React, Node.js, and Express to ensure full functionality.

➢ Design the system architecture for new components (CQI, Reporting, Survey) with a focus on scalability in the MERN stack.

➢ Develop CQI, Reporting, and Survey modules utilizing React for UI, Node.js for APIs, and SQL Server for data storage.

Conti...

➢ Perform iterative testing (unit and user acceptance) with Jest for frontend and Mocha for backend.

➢ Deploy the system on Quest servers with optimized configurations for scalability, security, and database integration.

➢ Gather feedback on system performance and refine the technology stack for improvements.

IMPLEMENTATION DETAILS OF FYDP-I

➢Resolved critical bugs in the Admin, Super Admin, and Teacher portals to enhance system functionality.

➢ Developed the Reporting Component to improve data visualization and representation.

➢ Improved class creation and student management features for better usability.

➢Performed initial testing and debugging to ensure system stability and reliability.

➢Collected user feedback and made refinements for better performance.

❑ Bugs fixes

Screen 1 — Commits (12:32 AM)
- Disabled links in sidebar with no pat... — 3mo — NazakatUmrani authored
- Fix: Dynamic backend url — 3mo — NazakatUmrani authored
- npm scripts to run on linux — Ishaque-Memon authored
- temporary static url for quest obe — 3mo — NazakatUmrani authored
- docker deployment + frontend scrip... — 3mo — NazakatUmrani authored
- working on students component — 3mo — NazakatUmrani authored
- Fix: App.jsx unique key error — 3mo — NazakatUmrani authored
- [Bug Fix] Dashboard rendering multi... — 4mo — NazakatUmrani authored
- ADD loading spinner to Superadmin... — 4mo — NazakatUmrani authored

Screen 2 — Commits (12:32 AM)
- Add: Batches + Fix: Students search... — 2mo — NazakatUmrani authored
- Fix: Programs table rows clickable +... — 2mo — NazakatUmrani authored
- Add Multiple students completed [b... — NazakatUmrani authored
- Add: Test instructions for docker bu... — 2mo — NazakatUmrani authored
- Fix: Disable devtools in production ... — 2mo — NazakatUmrani authored
- Security: Developer tools option dis... — 2mo — NazakatUmrani authored
- Add: add batch student - populate t... — 2mo — NazakatUmrani authored
- Working started on add student pag... — 2mo — NazakatUmrani authored
- Some files changed Minor — 2mo — NazakatUmrani authored

Screen 3 — Commits (12:32 AM)
- Removed msnodesqlv8 — 2mo — NazakatUmrani authored
- Fix: LoginPage widht + Font + Paddi... — 2mo — Ishaque-Memon authored
- Fix: Icons in HOD sidebar + Add Bat... — NazakatUmrani authored
- Added animation in Tailwind.config.j... — 2mo — Ishaque-Memon authored
- Fix: Leaders Card on the top of row ... — 2mo — Ishaque-Memon authored
- Fix: Abullah Memon, Profile Urls + ... — 3mo — Ishaque-Memon authored
- Developers Page Changed + Image ... — 3mo — Ishaque-Memon authored
- Fix: Devs page imgs not loading in p... — 3mo — NazakatUmrani authored
- Add: Developers page + Fix: Pagen... — 3mo — NazakatUmrani authored

Screen 4 — Commits (12:32 AM)
- some UI fixes and CLO bug resolved — 9d — Abdullah-Memon authored
- Fixed: Loader Integrated at Report Fi... — 12d — Ishaque-Memon authored
- Student Portal Route is Disabled — Ishaque-Memon authored
- Reporting ComponentIntegration at ... — 12d — Ishaque-Memon authored
- removed sub heading and report but... — 1mo — Bhaveendar-Sodho authored
- sub heading and report button remo... — 1mo — Bhaveendar-Sodho authored
- Fixed: Some Minor Bugs On HOD Da... — 1mo — Ishaque-Memon authored
- sub headings removed — 1mo — Bhaveendar-Sodho authored
- Fixes — 2mo — NazakatUmrani authored

❑ **Reporting system**

IMPLEMENTATION DETAILS OF PROGESSIVE-II

▶ All planned modules, including the **CQI** and **Reporting etc** components, were successfully developed and seamlessly integrated into the system.

▶ The **Reporting Component** was enhanced to support comprehensive analysis based on **CLOs** and **PLOs ,**alongside traditional GPA/CGPA metrics.

▶ The **Teacher Portal** was upgraded to include essential functionalities such as **classroom management**, **assignment handling**, **marks entry**, and **attendance tracking**.

▶ Critical system bugs remaining in FYDP-I were resolved, significantly improving system **stability and reliability**.

Conti...

▶ The overall **User Interface (UI)** and **User Experience (UX)** were refined for enhanced responsiveness, accessibility, and usability across all devices.

▶ **Database structure** and **backend queries** were optimized to boost system performance and reduce response times.

▶ The project concluded with the **successful deployment** of the enhanced OBE System, supported by complete **technical documentation**, ready for institutional use.

New Modules

Panel 1 (Left):

DEMO UNIVERSITY

SUPER ∨

- Dashboard
- Institute ∧
- View Institutes
- GPA Configurations
- Degree
- Semester
- Faculty
- Batches
- Department
- Programs
- Employees
- Students
- Reports ∨

Create New Configuration

GPA
Max GPA: 4

Grade	100-Mark Min %	50-Mark Min %	GPA Value
A+	85%	85%	3.86
A	75%	75%	3.70
B+	70%	70%	3.50
B	65%	65%	3.00
C+	60%	60%	2.50
C	50%	50%	2.00
F	0%	0%	0.00

New GPA Config
Max GPA: 4

Grade	100-Mark Min %	50-Mark Min %	GPA Value
F	0%	0%	0.00

Panel 2 (Center):

DEMO UNIVERSITY

SUPER ∨

- Dashboard
- Institute ∧
- View Institutes
- GPA Configurations
- Degree
- Semester
- Faculty
- Batches
- Department
- Programs
- Employees
- Students
- Reports ∨

Create New Configuration

GPA
Max GPA: 4

Grade	100		Value
A+	85%		
A	75%		
B+	70%		
B	65%		
C+	60%		
C	50%		
F	0%		

Create New GPA Configuration ✕

Configuration Title*
e.g., Standard 4.0 Scale

Maximum GPA*
4

Grade Configuration ⊕

Grade*	100-Mark Min %	50-Mark Min %	GPA Value*	Action
A+	100	213	0	
B	0	0	0	
C	0	0	0	
F	0	0	0	

Cancel   Create Configuration

New GPA Config
Max GPA: 4

Grade	100		Value
F	0%		

Panel 3 (Right):

DEMO UNIVERSITY

SUPER ∨

- Dashboard
- Institute ∧
- View Institutes
- GPA Configurations
- Degree
- Semester
- Faculty
- Batches
- Department
- Programs
- Employees
- Students
- Reports ∨

Batch Details
All the Batches of the University

🔍 Search   Add Batch

Department
All Departments

Program
All Programs

Batch List

SNO.	Batch Title	Program	Date	Action
1	20SW	Bachelor of Software Engineering	6/5/2025	✏ 🗑
2	21SW	Bachelor of Software Engineering	5/28/2025	✏ 🗑
3	24MECSE	Masters of Computer System Engineering	4/27/2025	✏ 🗑
4	20MECSE	Masters of Computer System Engineering	4/27/2025	✏ 🗑
5	20CSE	Bachelor of Computer System Engineering	4/21/2025	✏ 🗑

Home
Programs
Employees
Batches
Students
Courses
Classrooms ^
Assign
My Classes
Reports ∨

MTH105 | IS | THEORY
Islamic Studies/Ethics
Batch: 20CSE | Section: -

←

Topic: e.g Software Development Lifecycle

Date: 07 / 12 / 2025

Start Time: 07 : 04 AM   **End Time:** 08 : 04 AM   **Lectures:** 1

Take Attendance
All Present ∨

| 20CSE01 | 20CSE02 | 20CSE03 | 20CSE12 | 20CSE35 | 20CSE41 |
| 20CSE42 |

● Present: 5 ● Leave: 0 ● Absent: 2

Submit Attendance

MTH105 | IS | THEORY
Islamic Studies/Ethics
Batch: 20CSE | Section: -

← Submit Classroom

| Classroom | Students | Attendance ∨ | Activities | Reports ∨ | Files ∨ |

Classroom Attendance
↻ Detailed View

Roll No	Student Name	Present	Absent	Leave	Total
20CSE01	Abdullah Memon	6	2	0	6 / 8 (75%)
20CSE02	Fizza Soomro	4	4	0	4 / 8 (50%)
20CSE03	Bhaveendar Sodho	8	0	0	8 / 8 (100%)
20CSE12	Abdullah Memon	4	4	0	4 / 8 (50%)
20CSE35	Fizza Sheikh	2	4	2	4 / 8 (50%)
20CSE41	Nazakat Umrani	8	0	0	8 / 8 (100%)
20CSE42	Jameel Magsi	2	6	0	2 / 8 (25%)

OUTCOMES

➢ A fully functional and stable **Outcome-Based Education (OBE**) system was delivered.

➢ **CLO and PLO-based** performance analysis was successfully implemented in the reporting module.

➢ Teachers can now manage **assignments, attendance, and marks** efficiently through the enhanced portal.

➢ **CQI** module enables continuous monitoring of student learning outcomes and corrective actions.

➢ User experience was significantly improved across all roles (Admin, Teacher, SuperAdmin).

➢ System performance was optimized for large-scale academic data processing.

➢ The system is now deployment-ready and can be scaled or integrated into institutional workflows.

SUMMARY

▶ In **FYDP-II**, we completed and improved the OBE system started in **FYDP-I**. New modules like the **CQI , GPA configuration , batch and more** were added to support better assessment and quality improvement. The reporting system was upgraded to show **CLO and PLO** results. The Teacher Portal was enhanced with **attendance, marks entry, and class management**. We fixed bugs, improved speed, added notifications, and made the system more secure. After full testing, the system was successfully **deployed** and **is ready for use**.

Reference

➢ Pakistan Engineering Council (PEC) Website.

➢ **Head of department** Dr. Pardeep kumar

➢ **A Review on Outcome Based Education and Factors That Impact Student Learning Outcomes in Tertiary Education System**

Education Resources Information Center (ERIC), 2020.

➢ **Toward Developing Intelligent Mobile OBE System in Higher Learning Institution** (*arXiv preprint*, 2021)

➢ Washington Accord

➢ ABET. (2020). *Criteria for **Accrediting Engineering** Programs*. Accreditation Board for Engineering and Technology.

Thank You