Student Management System Project Phase 1 – Report

1. Description of your proposed platform

The proposed web platform is a role-based course management system designed to serve three types of users: students, instructors, and administrators. Each user type is granted specific functionalities based on their role, with the goal of streamlining the course registration, learning, and administration processes in an academic environment.

Student Functionality

Upon successful login or registration, student users are directed to the main page, which displays a list of all available courses by default. Students can refine their search using filters based on course name (e.g., JavaScript, OOP) or course category (e.g., Databases, Programming). Once a course is selected, the student is directed to the registration page, where multiple class sections (taught by different instructors) for the selected course are displayed.

Students are allowed to register for a course only if three conditions are met:

1. They have successfully completed all prerequisite courses and if the perquisite is in the in progress course as we considered the date after the drop course which means that the student has to successfully finish the course.
2. The course is currently open for registration.
3. The course has available seats

If the student meets these conditions and the selected class still has available slots, registration proceeds. A confirmation message is displayed upon successful registration, and course data is updated accordingly. However, the registration remains pending until officially validated by an administrator.

The platform also features a navigation bar, through which students can access their profile page. The profile page presents a comprehensive overview of the student's learning path, including:

- Courses completed successfully (with corresponding grades),
- Courses currently in progress,
- Courses pending approval (i.e., registration submitted but not yet validated or started).
- Courses remaining

Instructor Functionality

After logging in, instructors are redirected to their main page, which categorizes their assigned classes into three sections: In Progress, Pending, and Completed.

- In Progress: These are active classes where the instructor can click to access the grades page. In this page, the instructor can view the list of enrolled students and is allowed to input and submit their grades for record-keeping.
- Pending: These are classes that have not yet been validated by the administrator. Although the instructor can access the grades page for pending classes, the system will not allow grade submission until the class is officially validated and moved to the "In Progress" category.

- Completed: This section includes all courses that have been finished after the instructor submitted the final grades for students in the "In Progress" classes.

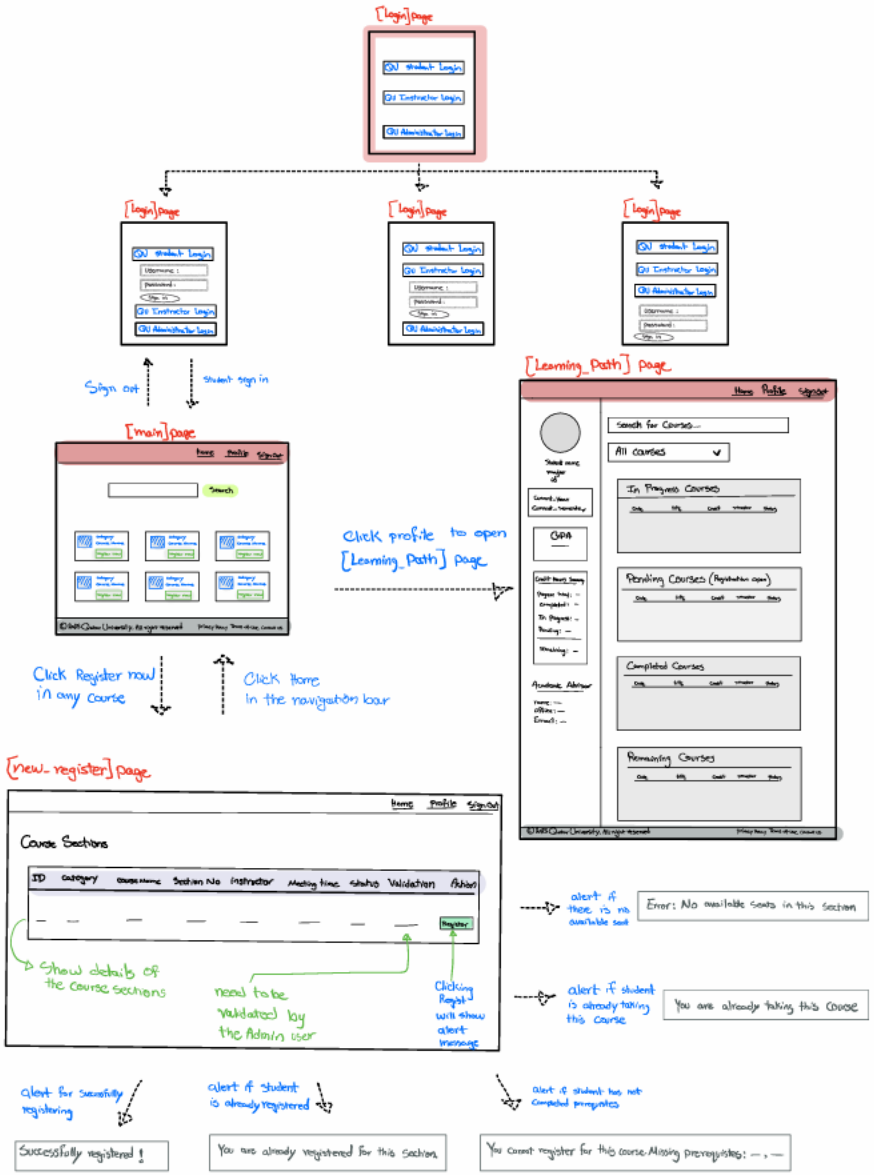
This structured view helps instructors clearly distinguish between the status of their classes and manage their responsibilities efficiently.

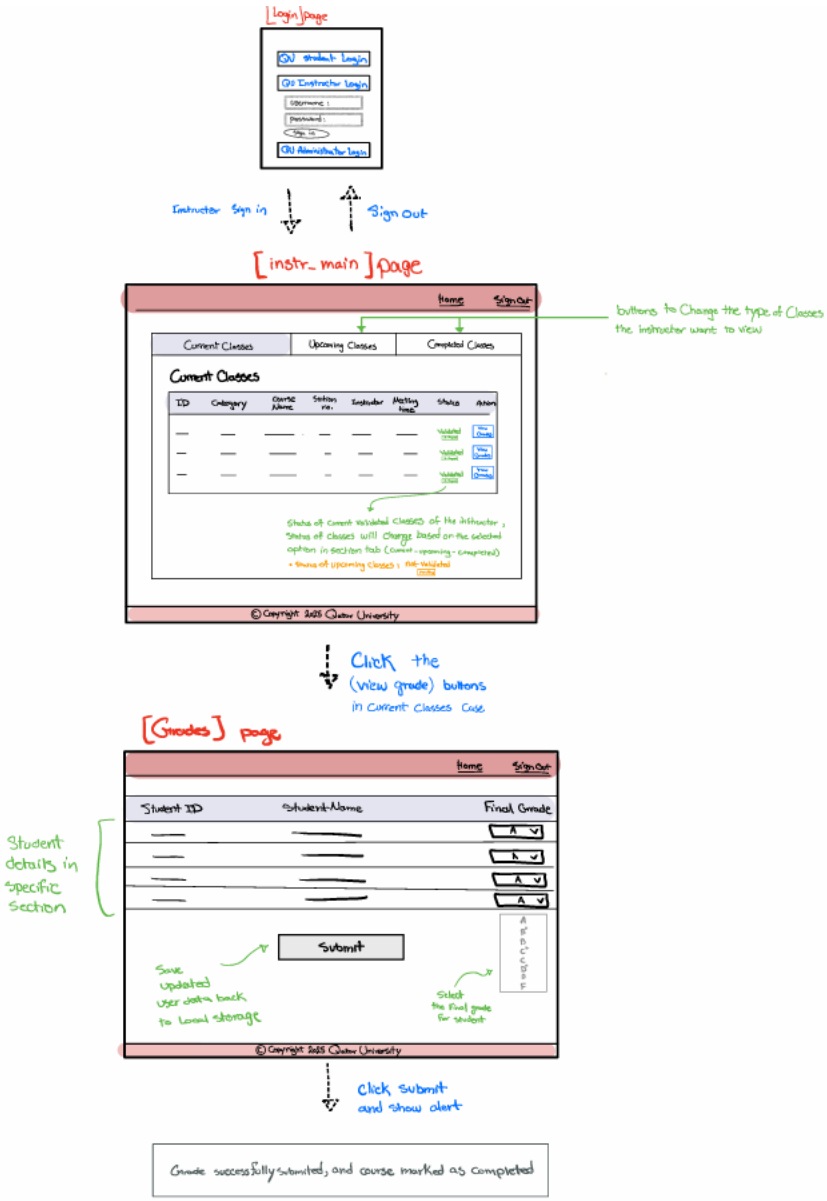
Administrator Functionality

Administrators gain access to a centralized dashboard after login, which displays all Pending courses and classes. These are courses or class sections that have not yet been validated. Administrators have the authority to officially validate them, upon which their status changes to In Progress, allowing them to begin.

If an administrator chooses to unvalidate a course or class, it is effectively deleted from the system as a pending item. This mechanism ensures that only courses with sufficient student interest and appropriate setup proceed to the learning phase. Additionally, administrators have the capability to create new courses and assign instructors to specific class sections, enabling full control over academic offerings and scheduling.

Sketch:




[Login]page
Instructor Sign in
Sign out
[instr_main]page
Home
Sign Out
buttons to Change the type of Classes the instructor wants to view
Current Classes
Upcoming Classes
Completed Classes
Current Classes
ID
Category
Course Name
Section no.
Instructor
Meeting time
Status
Action
Status of Current Validated Classes of the instructor, Status of classes will Change based on the selected option in section tab (Current - upcoming - completed)
Status of Upcoming classes : not-Validated
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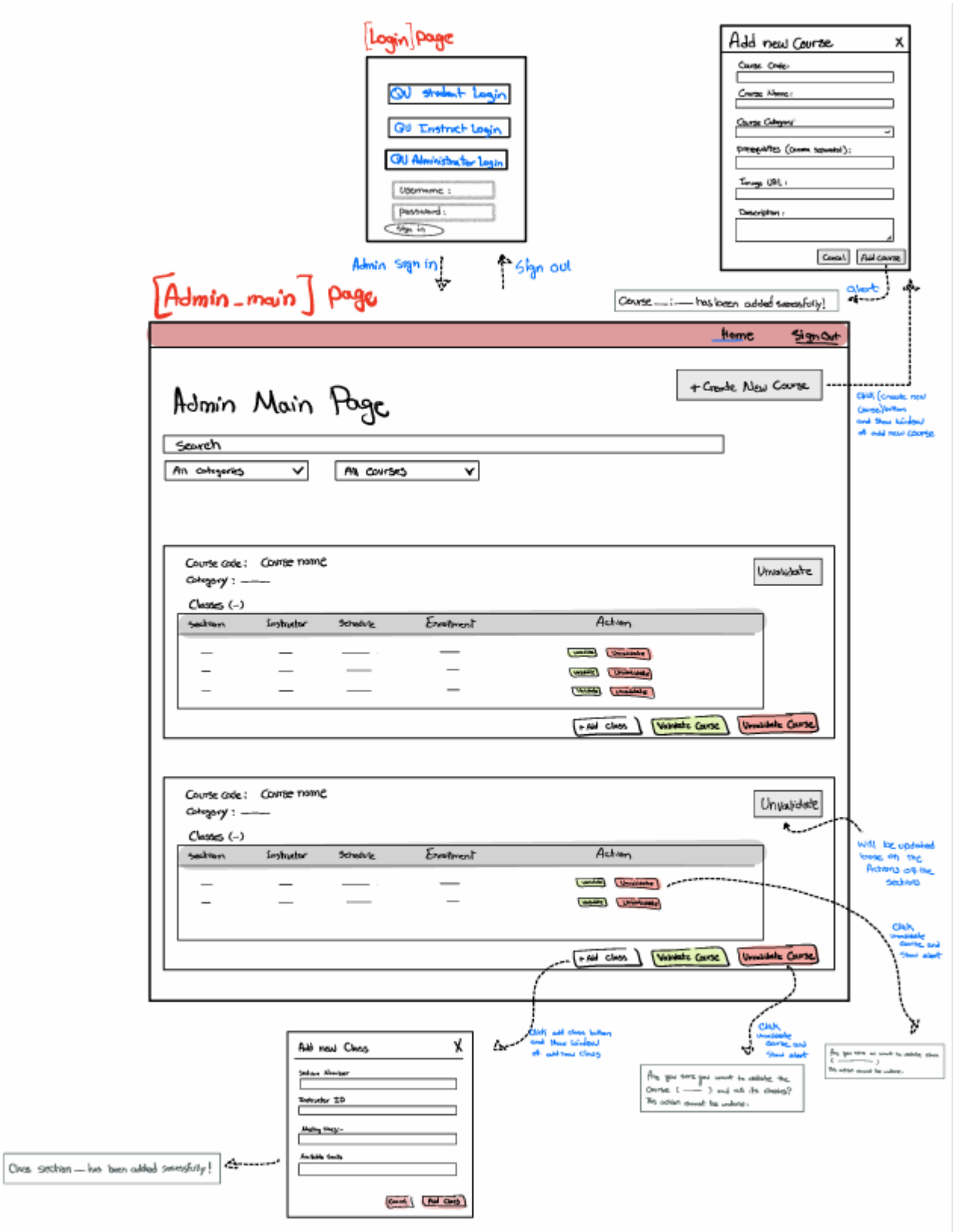
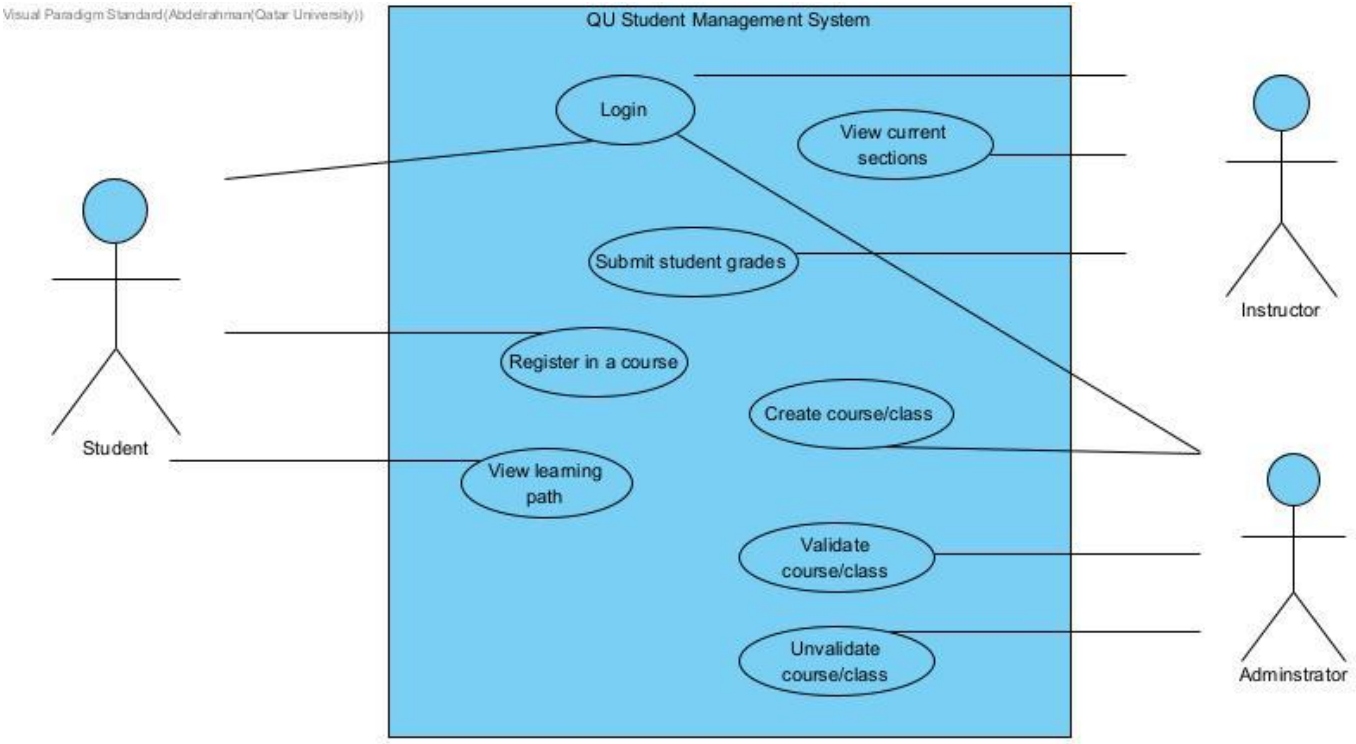
Click the (view grade) buttons in Current Classes Case
[Grades] page
Home
Sign Out
Student ID
Student Name
Final Grade
Student details in specific Section
Submit
Save updated user data back to Local storage
Select the final grade for student
A
B
C
D
E
F
© Copyright 2025 Qatar University
Click submit and show alert
Grade successfully submited, and course marked as completed

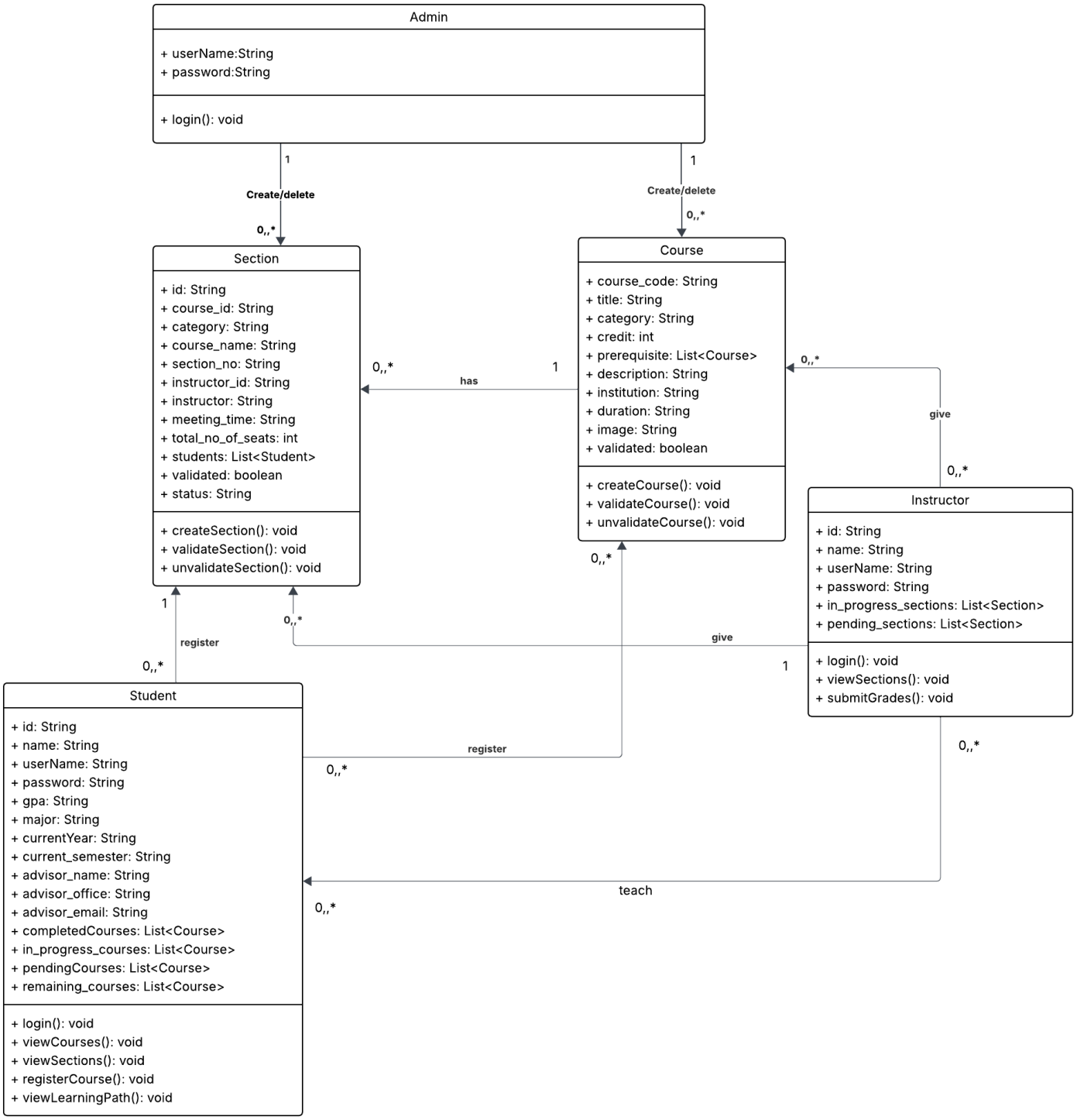

[Login] page
Student Login
Instruct Login
Administrator Login
Username :
Password :
Sign in
Admin sign in
Sign out
[Admin_main] page
Add new Course
Course Code:
Course Name:
Course Category:
prerequisites (comma separated):
Image URL:
Description:
Cancel
Add course
Course ... : — has been added successfully!
alert
Home
Sign Out
Admin Main Page
+ Create New Course
Click (Create new course) button and show window of add new course
Search
All categories
All courses
Course code : Course name
Category : ——
Unvalidate
Classes (–)
Section
Instructor
Schedule
Enrollment
Action
+ Add class
Validate Course
Unvalidate Course
Will be updated course with the Actions of the sections
Click Unvalidate course and show alert
Click add class button and show window of add new class
Click Unvalidate course and show alert
Are you sure you want to validate the Course (——) and all its classes? This action cannot be undone.
Are you sure you want to unvalidate the Course (——) and all its classes? This action cannot be undone.
Add new Class
Section Number
Instructor ID
Meeting Days:-
Available Seats
Cancel
Add Class
Class section — has been added successfully!

2. Application Design

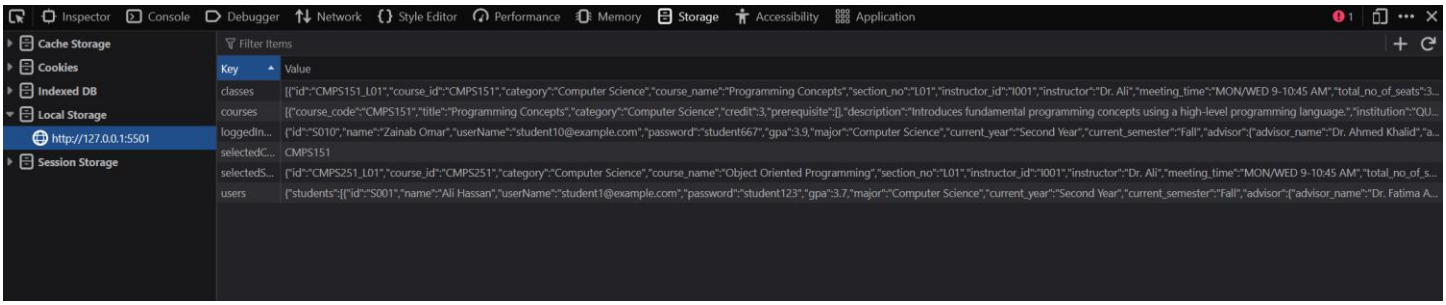
2.1. Use case diagram

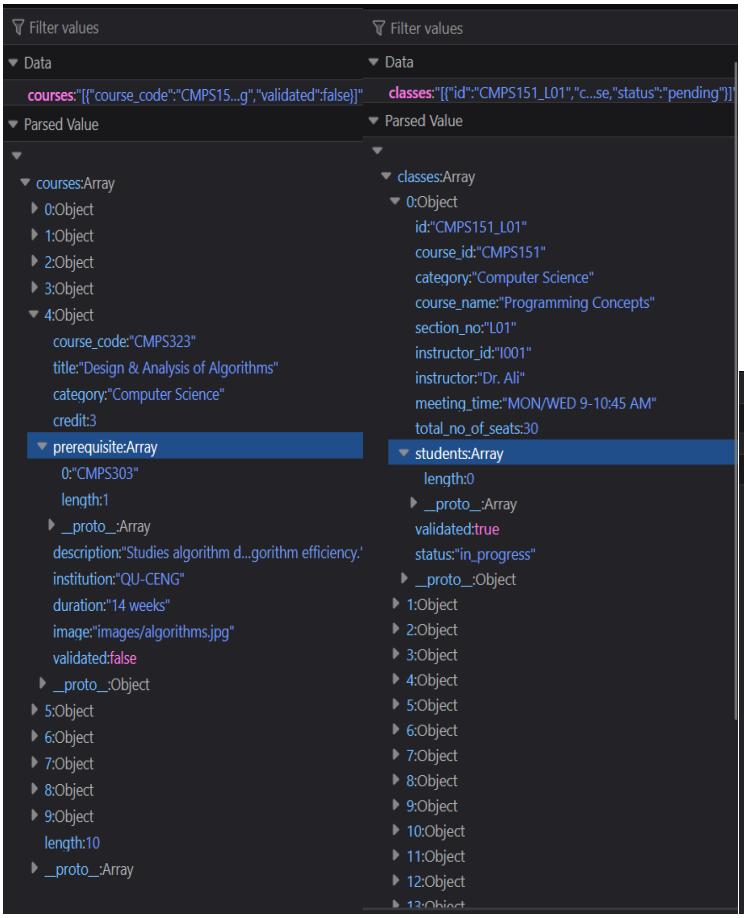


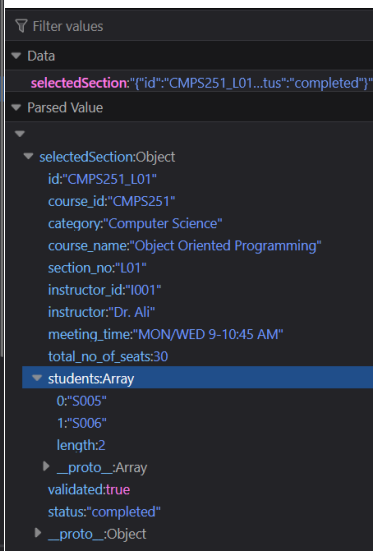
2.2. Entities class diagram

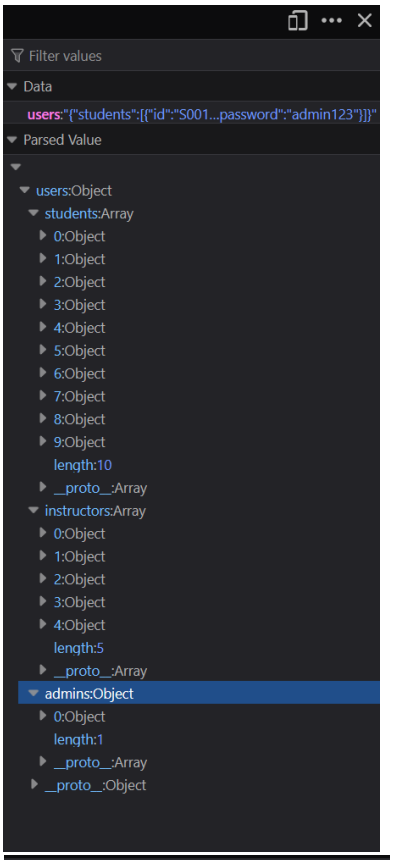


2.3. Web API class








Filter values
Data
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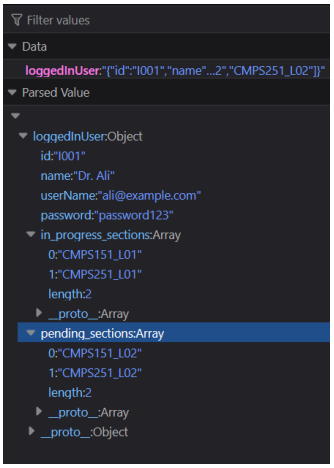
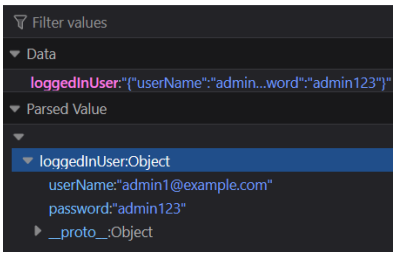
Parsed Value
users:Object
students:Array
0:Object
1:Object
2:Object
3:Object
4:Object
5:Object
6:Object
7:Object
8:Object
9:Object
length:10
__proto__:Array
instructors:Array
0:Object
1:Object
2:Object
3:Object
4:Object
length:5
__proto__:Array
admins:Object
0:Object
length:1
__proto__:Array
__proto__:Object


Filter values
Data
loggedInUser:"{"id":"I001","name"...2","CMPS251_L02"}}"
Parsed Value
loggedInUser:Object
id:"I001"
name:"Dr. Ali"
userName:"ali@example.com"
password:"password123"
in_progress_sections:Array
0:"CMPS151_L01"
1:"CMPS251_L01"
length:2
__proto__:Array
pending_sections:Array
0:"CMPS151_L02"
1:"CMPS251_L02"
length:2
__proto__:Array
__proto__:Object


Filter values
Data
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Parsed Value
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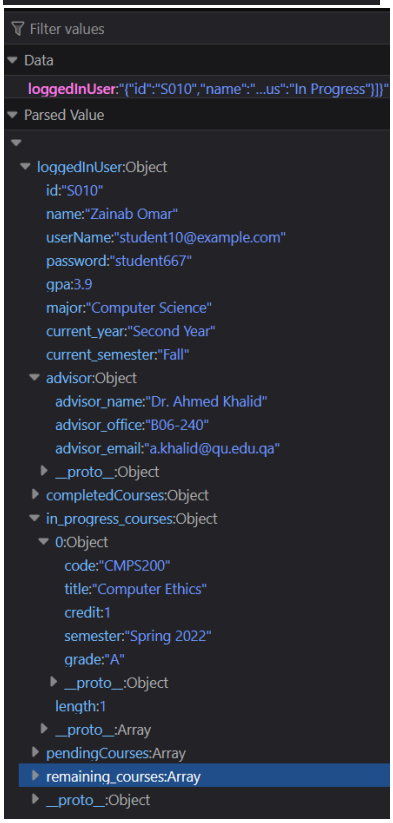
userName:"admin1@example.com"
password:"admin123"
__proto__:Object


Filter values
Data
loggedInUser:"{"id":"S010","name":"...us":"In Progress"}}"
Parsed Value
loggedInUser:Object
id:"S010"
name:"Zainab Omar"
userName:"student10@example.com"
password:"student667"
gpa:3.9
major:"Computer Science"
current_year:"Second Year"
current_semester:"Fall"
advisor:Object
advisor_name:"Dr. Ahmed Khalid"
advisor_office:"B06-240"
advisor_email:"a.khalid@qu.edu.qa"
__proto__:Object
completedCourses:Object
in_progress_courses:Object
0:Object
code:"CMPS200"
title:"Computer Ethics"
credit:1
semester:"Spring 2022"
grade:"A"
__proto__:Object
length:1
__proto__:Array
pendingCourses:Array
remaining_courses:Array
__proto__:Object

3. Implementation

3.1. Implemented use-cases

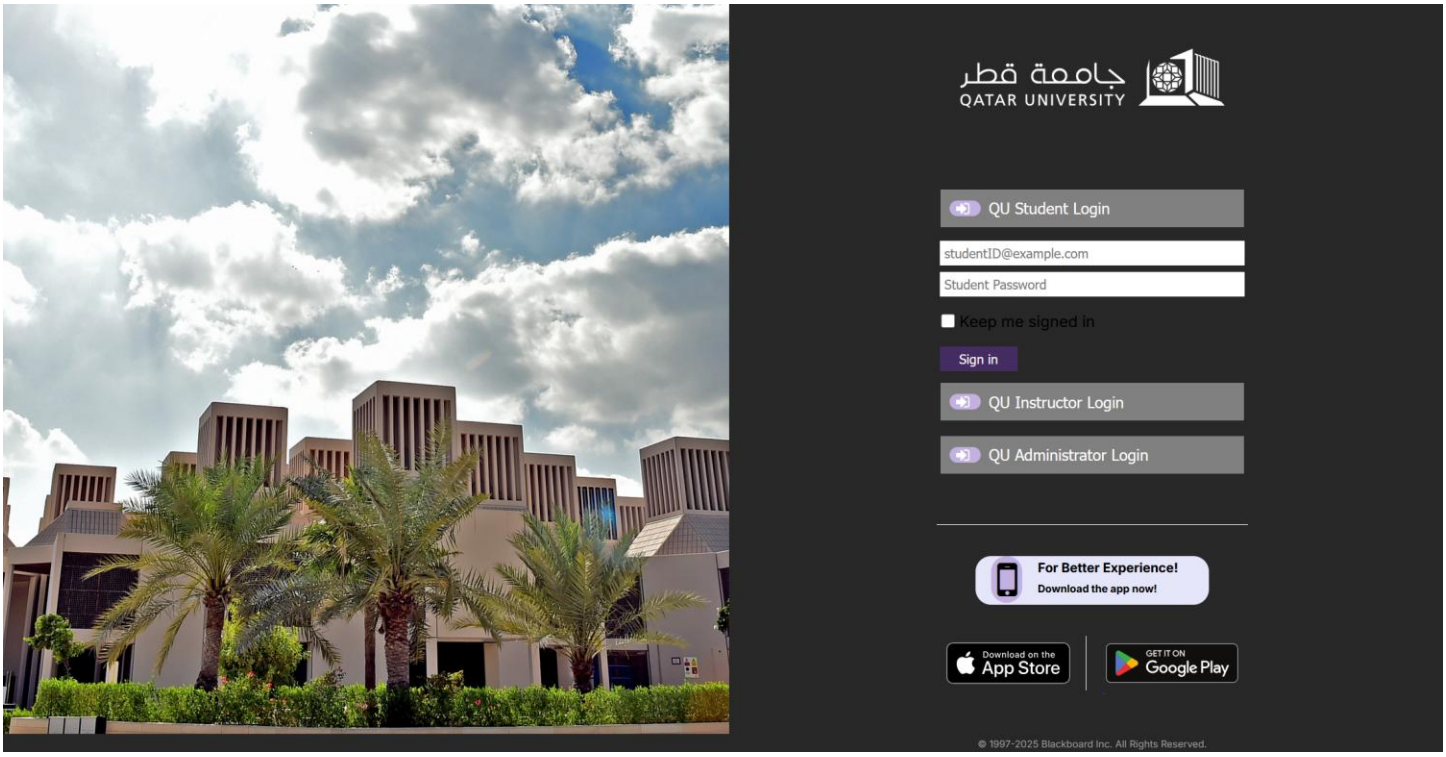
Use Case 1: Login
Use Case 2: Search and display available courses
Use Case 3: Register in a course
Use Case 4: View their learning path
Use Case 5: Creating / validating courses and classes
Use Case 6: Grades submission

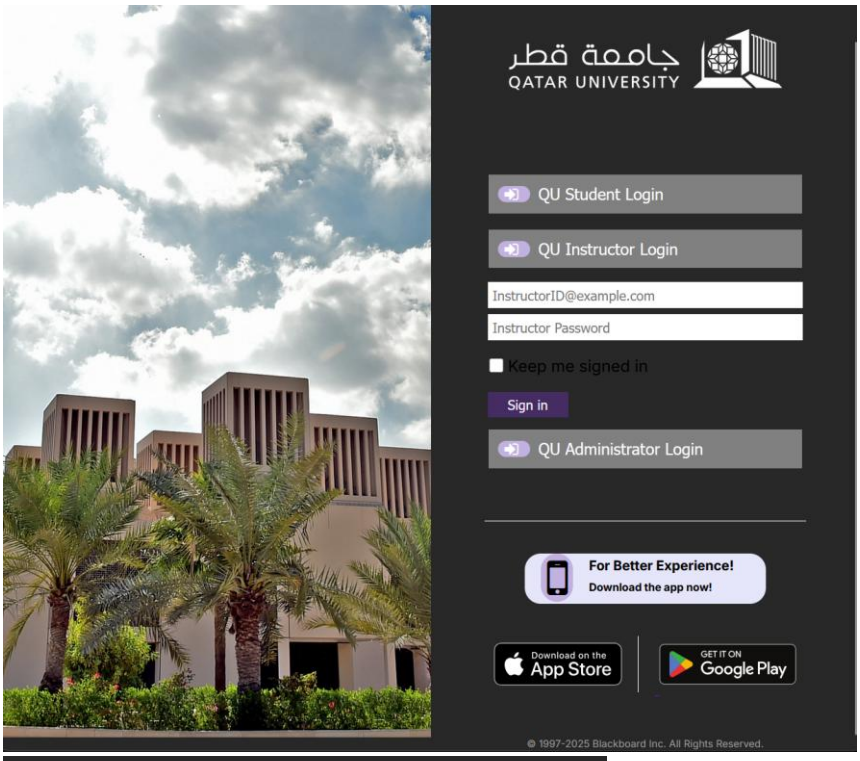
3.2. Unimplemented use-cases and not functioning parts

In use case (5): Only pending courses and classes can be validated and vice versa assuming that in-progress courses and classes are already validated and can not be deleted.

4. Testing

4.1. Use case 1

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QU Student Login
QU Instructor Login
InstructorID@example.com
Instructor Password
Keep me signed in
Sign in
QU Administrator Login
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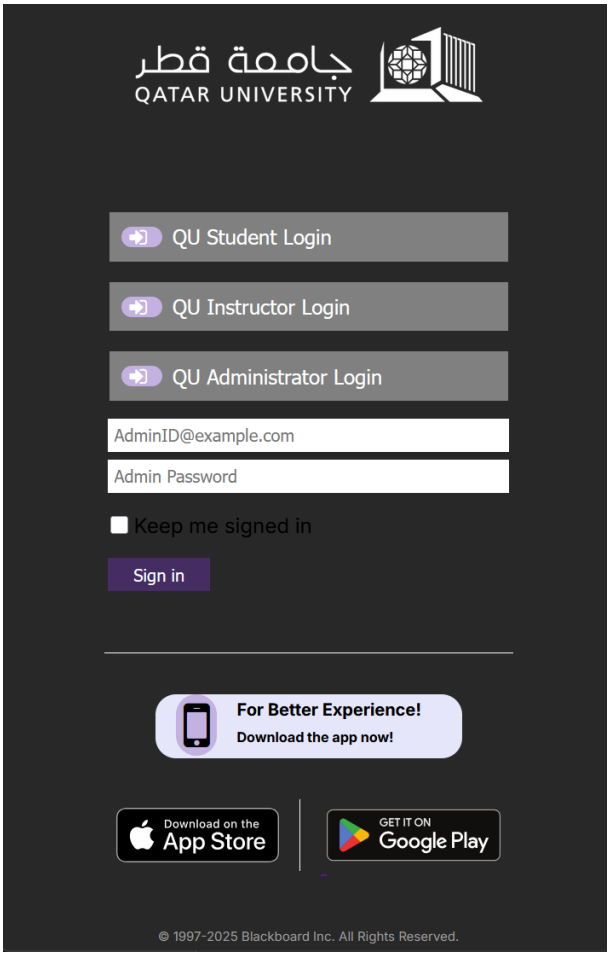
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QATAR UNIVERSITY
QU Student Login
QU Instructor Login
QU Administrator Login
AdminID@example.com
Admin Password
Keep me signed in
Sign in
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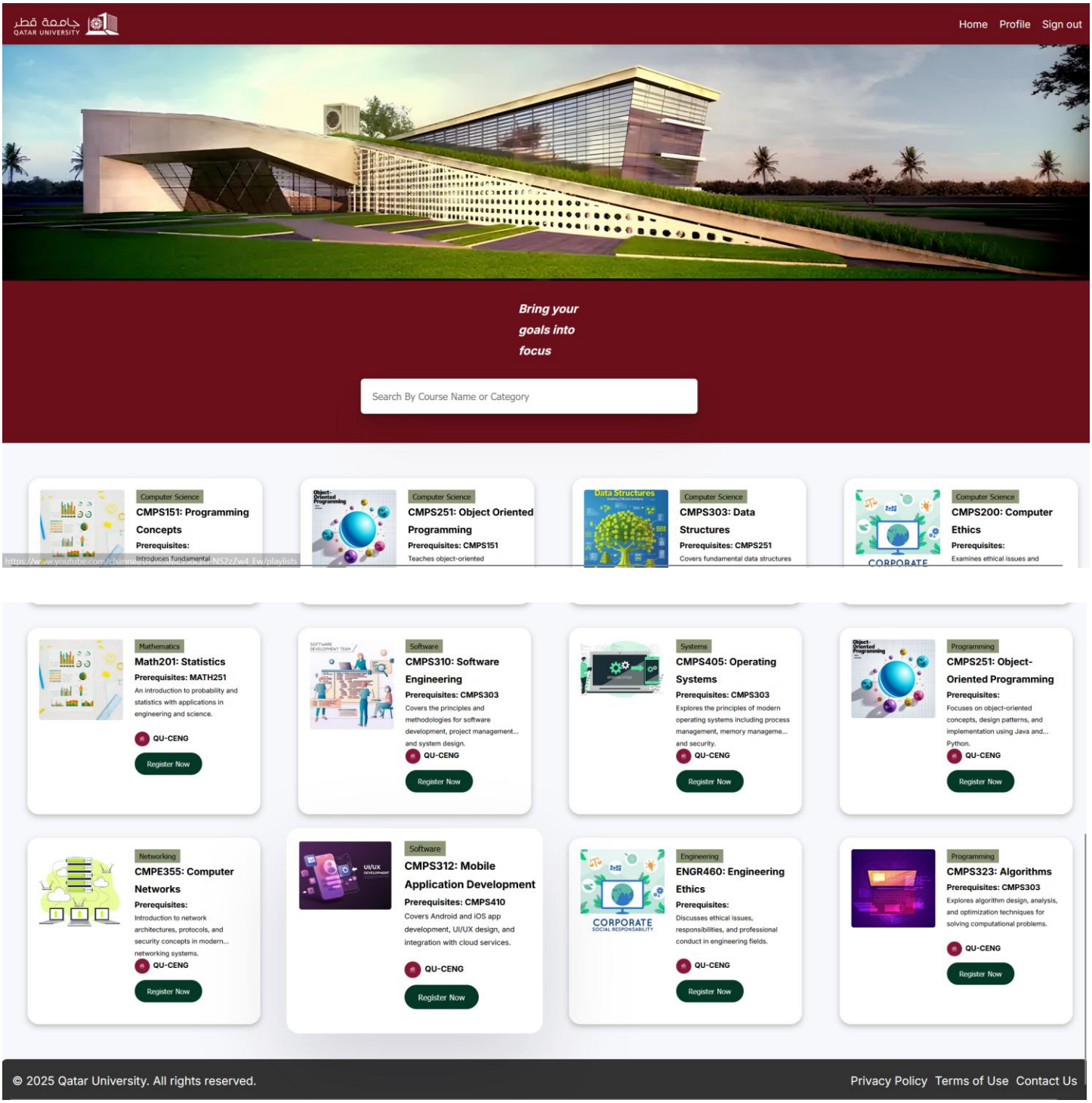
4.2. Use case 2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Home
Profile
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Bring your goals into focus
Search By Course Name or Category
Computer Science
CMPS151: Programming Concepts
Prerequisites:
Introduces fundamental
Computer Science
CMPS251: Object Oriented Programming
Prerequisites: CMPS151
Teaches object-oriented
Computer Science
CMPS303: Data Structures
Prerequisites: CMPS251
Covers fundamental data structures
Computer Science
CMPS200: Computer Ethics
Prerequisites:
Examines ethical issues and
Mathematics
Math201: Statistics
Prerequisites: MATH251
An introduction to probability and statistics with applications in engineering and science.
QU-CENG
Register Now
Software
CMPS310: Software Engineering
Prerequisites: CMPS303
Covers the principles and methodologies for software development, project management... and system design.
QU-CENG
Register Now
Systems
CMPS405: Operating Systems
Prerequisites: CMPS303
Explores the principles of modern operating systems including process management, memory manageme... and security.
QU-CENG
Register Now
Programming
CMPS251: Object-Oriented Programming
Prerequisites:
Focuses on object-oriented concepts, design patterns, and implementation using Java and... Python.
QU-CENG
Register Now
Networking
CMPE355: Computer Networks
Prerequisites:
Introduction to network architectures, protocols, and security concepts in modern... networking systems.
QU-CENG
Register Now
Software
CMPS312: Mobile Application Development
Prerequisites: CMPS410
Covers Android and iOS app development, UI/UX design, and integration with cloud services.
QU-CENG
Register Now
Engineering
ENGR460: Engineering Ethics
Prerequisites:
Discusses ethical issues, responsibilities, and professional conduct in engineering fields.
QU-CENG
Register Now
Programming
CMPS323: Algorithms
Prerequisites: CMPS303
Explores algorithm design, analysis, and optimization techniques for solving computational problems.
QU-CENG
Register Now
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Terms of Use
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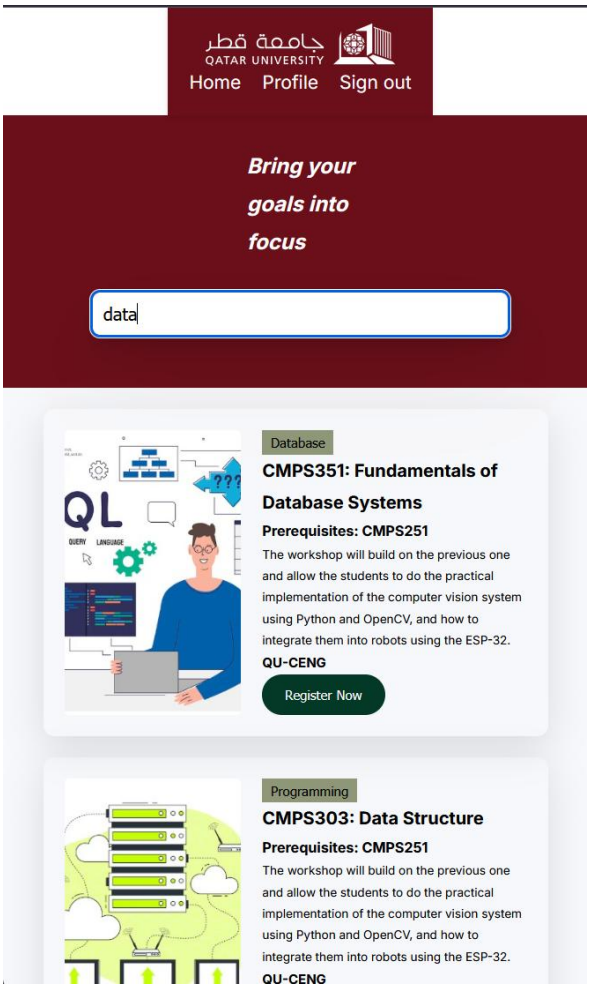
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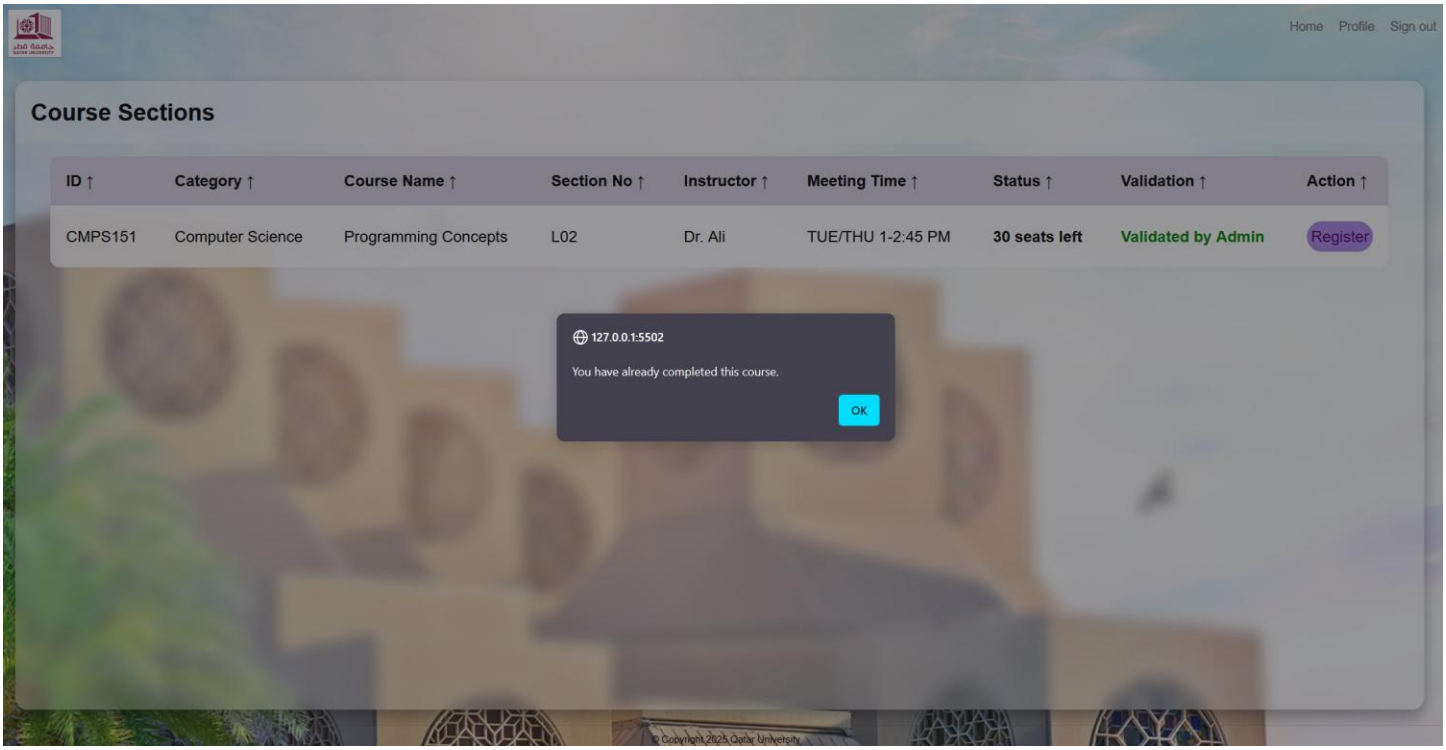
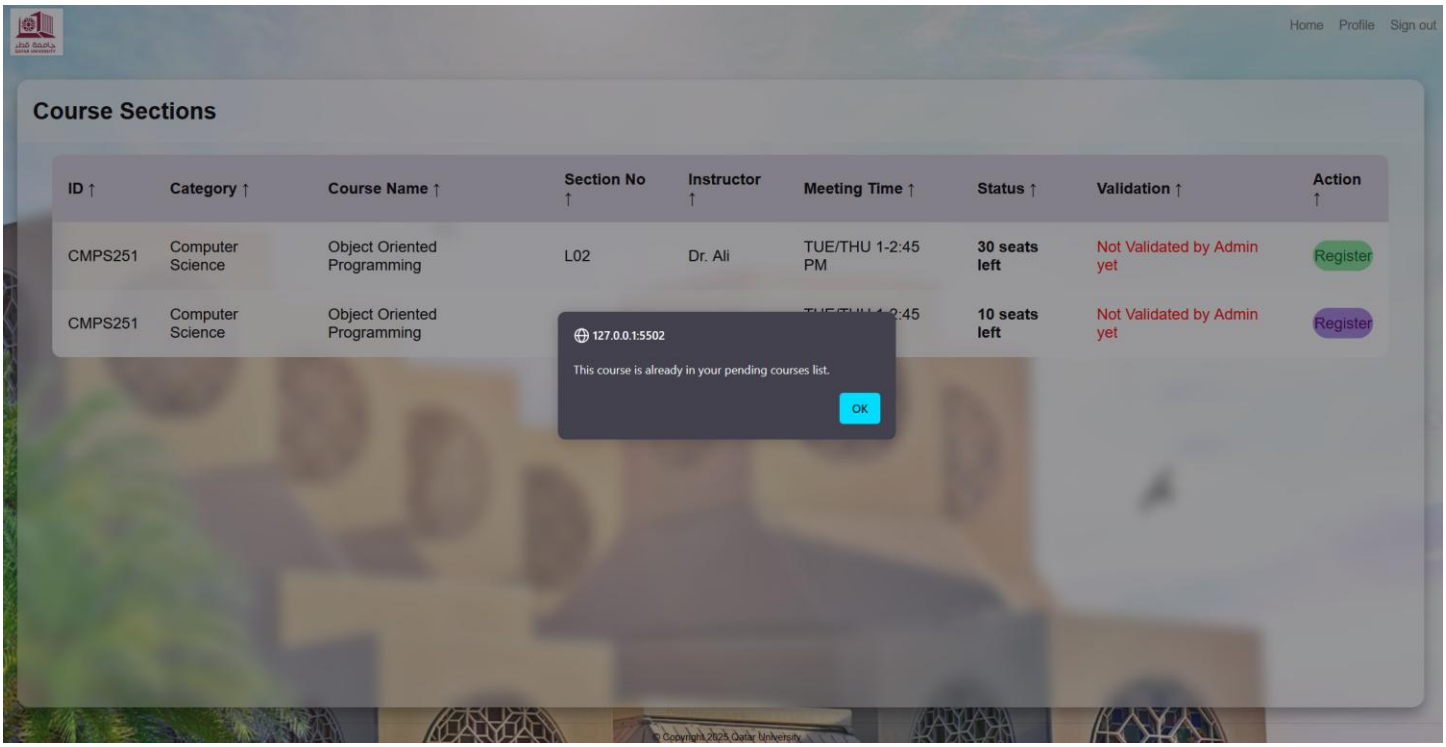
Bring your goals into focus
data
Database
CMPS351: Fundamentals of Database Systems
Prerequisites: CMPS251
The workshop will build on the previous one and allow the students to do the practical implementation of the computer vision system using Python and OpenCV, and how to integrate them into robots using the ESP-32.
QU-CENG
Register Now
Programming
CMPS303: Data Structure
Prerequisites: CMPS251
The workshop will build on the previous one and allow the students to do the practical implementation of the computer vision system using Python and OpenCV, and how to integrate them into robots using the ESP-32.
QU-CENG

4.3. Use case 3


Home Profile Sign out
Course Sections
ID ↑ Category ↑ Course Name ↑ Section No ↑ Instructor ↑ Meeting Time ↑ Status ↑ Validation ↑ Action ↑
CMPS151 Computer Science Programming Concepts L02 Dr. Ali TUE/THU 1-2:45 PM 30 seats left Validated by Admin Register
127.0.0.1:5502
You have already completed this course.
OK


Home Profile Sign out
Course Sections
ID ↑ Category ↑ Course Name ↑ Section No ↑ Instructor ↑ Meeting Time ↑ Status ↑ Validation ↑ Action ↑
CMPS251 Computer Science Object Oriented Programming L02 Dr. Ali TUE/THU 1-2:45 PM 30 seats left Not Validated by Admin yet Register
CMPS251 Computer Science Object Oriented Programming 10 seats left Not Validated by Admin yet Register
127.0.0.1:5502
This course is already in your pending courses list.
OK
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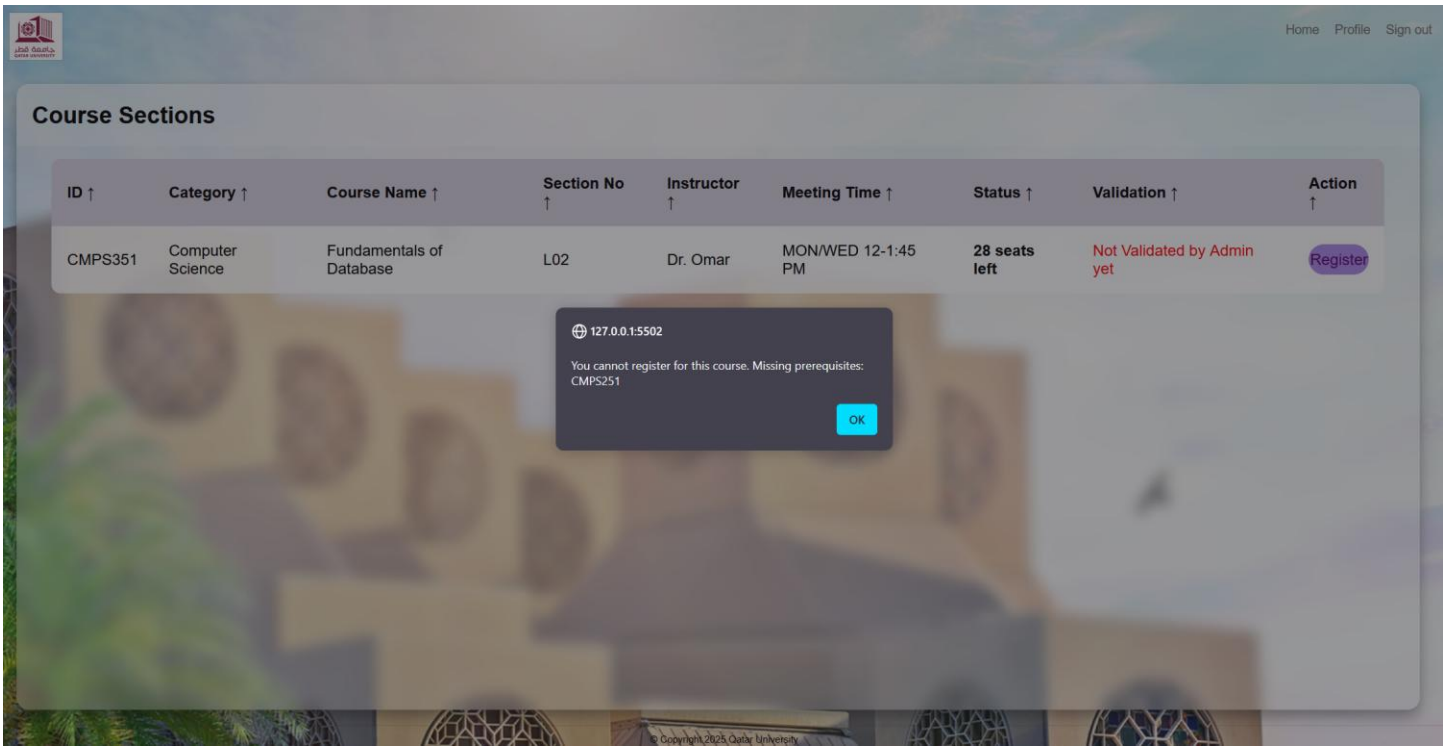
Home Profile Sign out
Course Sections
ID ↑ Category ↑ Course Name ↑ Section No ↑ Instructor ↑ Meeting Time ↑ Status ↑ Validation ↑ Action ↑
CMPS351 Computer Science Fundamentals of Database L02 Dr. Omar MON/WED 12-1:45 PM 28 seats left Not Validated by Admin yet Register
127.0.0.1:5502
You cannot register for this course. Missing prerequisites: CMPS251
OK
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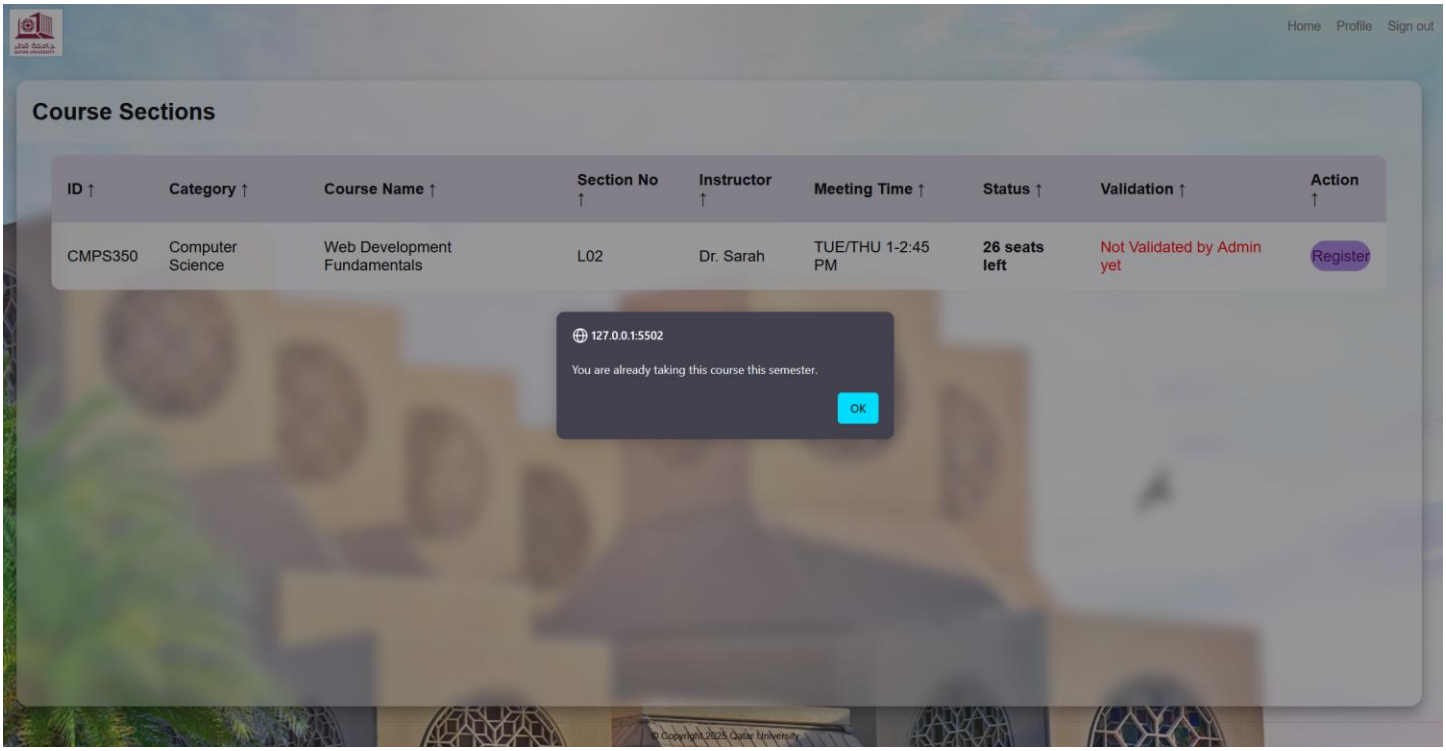
Home Profile Sign out
Course Sections
ID ↑ Category ↑ Course Name ↑ Section No ↑ Instructor ↑ Meeting Time ↑ Status ↑ Validation ↑ Action ↑
CMPS350 Computer Science Web Development Fundamentals L02 Dr. Sarah TUE/THU 1-2:45 PM 26 seats left Not Validated by Admin yet Register
127.0.0.1:5502
You are already taking this course this semester.
OK
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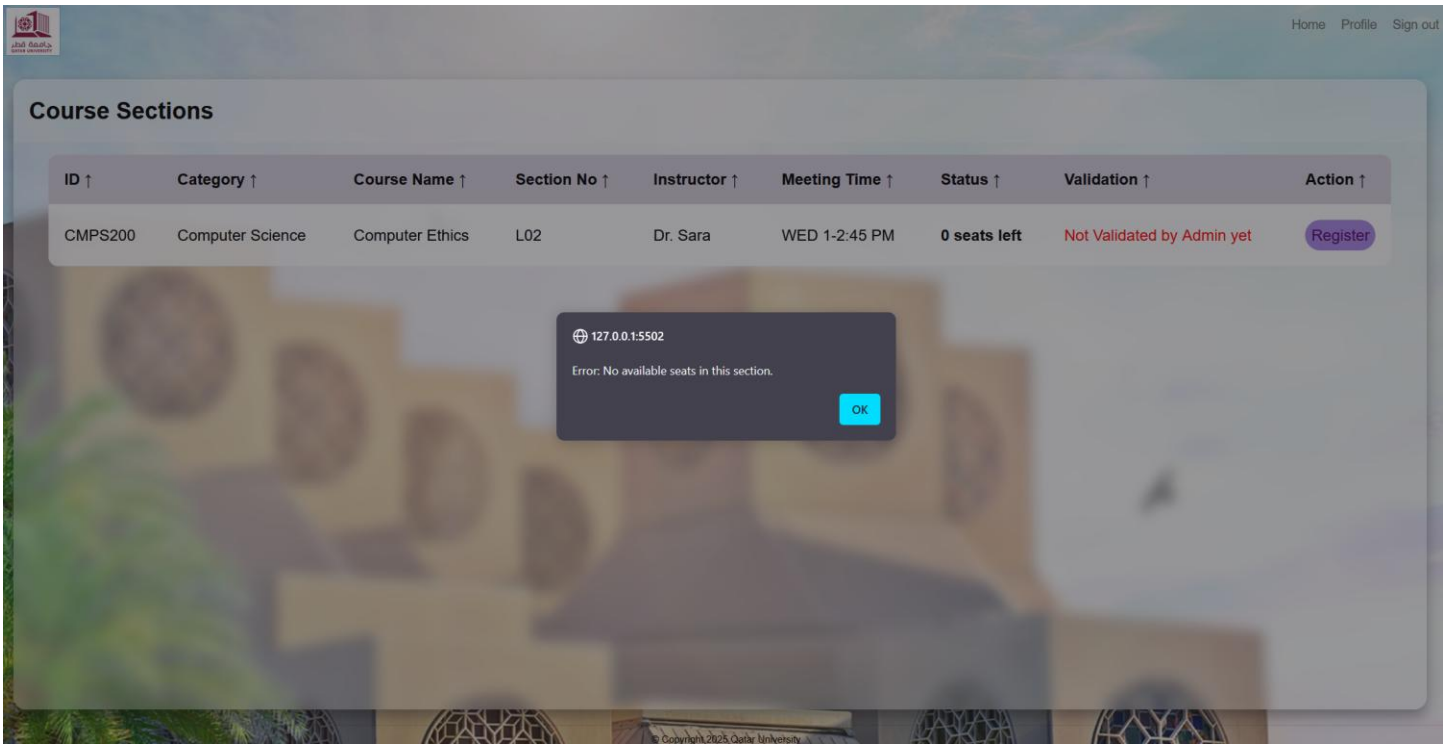
Home Profile Sign out
Course Sections
ID ↑ Category ↑ Course Name ↑ Section No ↑ Instructor ↑ Meeting Time ↑ Status ↑ Validation ↑ Action ↑
CMPS200 Computer Science Computer Ethics L02 Dr. Sara WED 1-2:45 PM 0 seats left Not Validated by Admin yet Register
127.0.0.1:5502
Error: No available seats in this section.
OK
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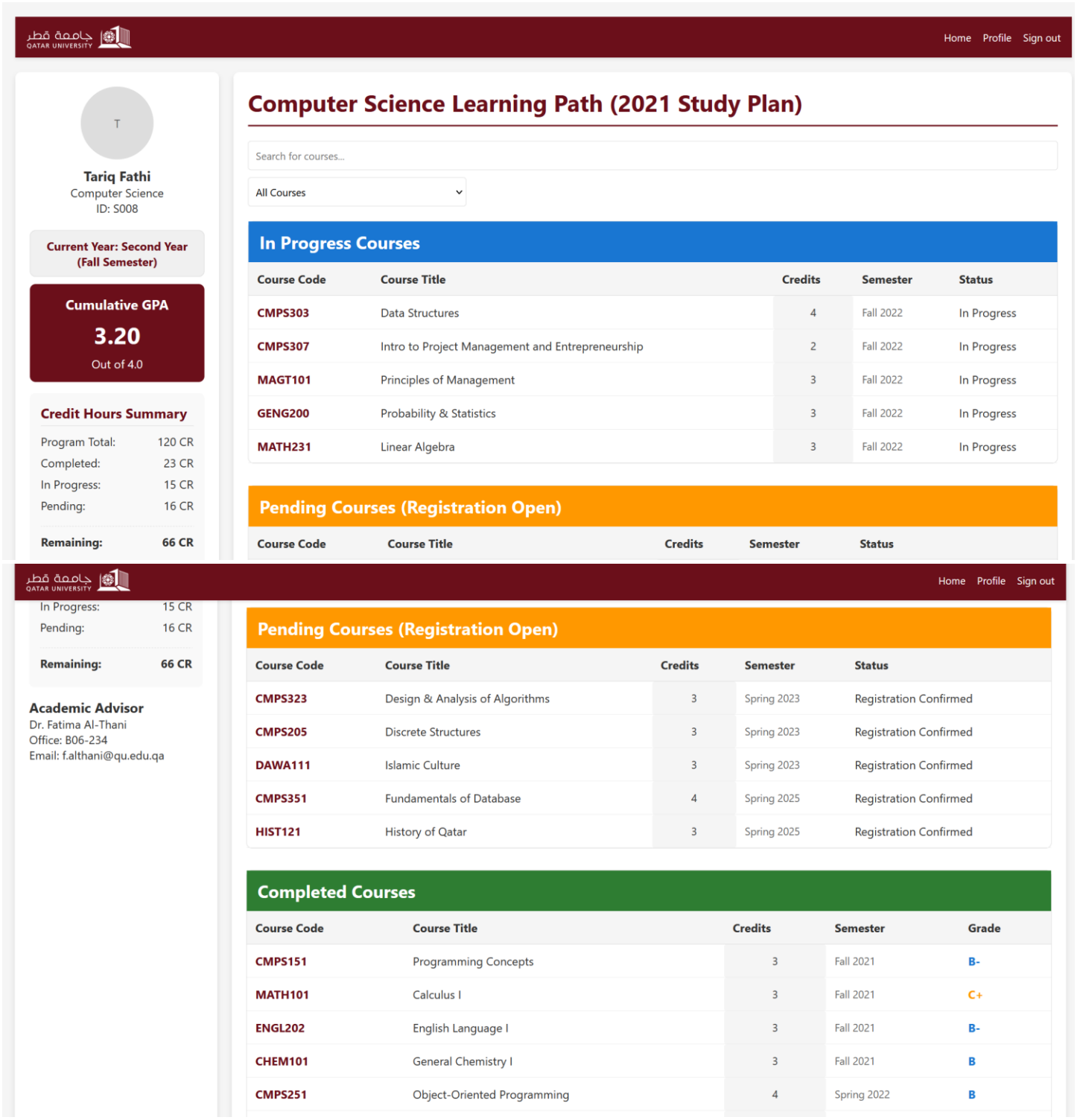
4.4. Use case 4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T
Tariq Fathi
Computer Science
ID: S008
Current Year: Second Year (Fall Semester)
Cumulative GPA
3.20
Out of 4.0
Credit Hours Summary
Program Total: 120 CR
Completed: 23 CR
In Progress: 15 CR
Pending: 16 CR
Remaining: 66 CR
Academic Advisor
Dr. Fatima Al-Thani
Office: B06-234
Email: f.althani@qu.edu.qa
Computer Science Learning Path (2021 Study Plan)
Search for courses...
All Courses
In Progress Courses
Course Code | Course Title | Credits | Semester | Status
CMPS303 | Data Structures | 4 | Fall 2022 | In Progress
CMPS307 | Intro to Project Management and Entrepreneurship | 2 | Fall 2022 | In Progress
MAGT101 | Principles of Management | 3 | Fall 2022 | In Progress
GENG200 | Probability & Statistics | 3 | Fall 2022 | In Progress
MATH231 | Linear Algebra | 3 | Fall 2022 | In Progress
Pending Courses (Registration Open)
Course Code | Course Title | Credits | Semester | Status
CMPS323 | Design & Analysis of Algorithms | 3 | Spring 2023 | Registration Confirmed
CMPS205 | Discrete Structures | 3 | Spring 2023 | Registration Confirmed
DAWA111 | Islamic Culture | 3 | Spring 2023 | Registration Confirmed
CMPS351 | Fundamentals of Database | 4 | Spring 2025 | Registration Confirmed
HIST121 | History of Qatar | 3 | Spring 2025 | Registration Confirmed
Completed Courses
Course Code | Course Title | Credits | Semester | Grade
CMPS151 | Programming Concepts | 3 | Fall 2021 | B-
MATH101 | Calculus I | 3 | Fall 2021 | C+
ENGL202 | English Language I | 3 | Fall 2021 | B-
CHEM101 | General Chemistry I | 3 | Fall 2021 | B
CMPS251 | Object-Oriented Programming | 4 | Spring 2022 | B

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Completed Courses

Course Code	Course Title	Credits	Semester	Grade
CMPS151	Programming Concepts	3	Fall 2021	B-
MATH101	Calculus I	3	Fall 2021	C+
ENGL202	English Language I	3	Fall 2021	B-
CHEM101	General Chemistry I	3	Fall 2021	B
CMPS251	Object-Oriented Programming	4	Spring 2022	B
ENGL203	English Language II	3	Spring 2022	B
MATH102	Calculus II	3	Spring 2022	C+
CMPS200	Computer Ethics	1	Spring 2022	A-

Remaining Courses

Course Code	Course Title	Credits	Year	Prerequisites
CMPS350	Web Development Fundamentals	3	Year 3 - Fall	CMPS251
CMPS310	Software Engineering	4	Year 3 - Fall	CMPS251

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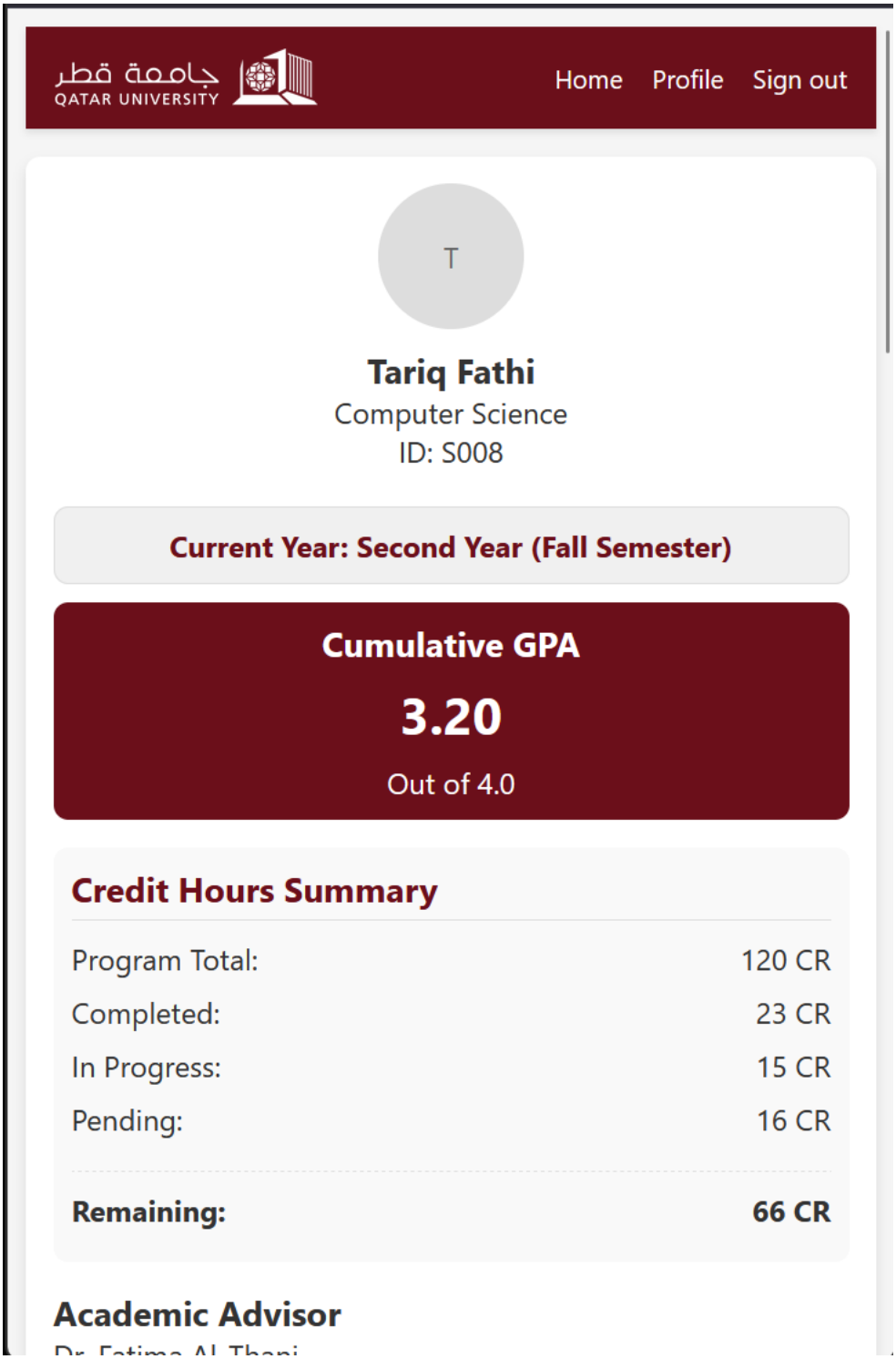
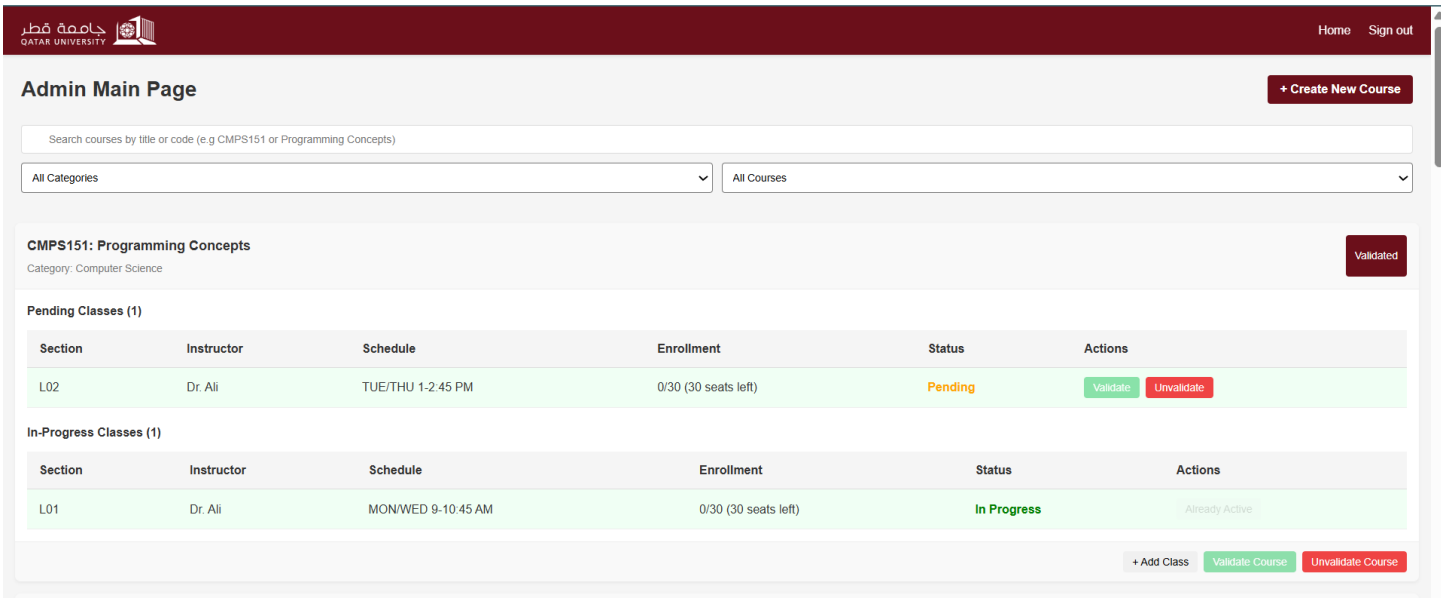
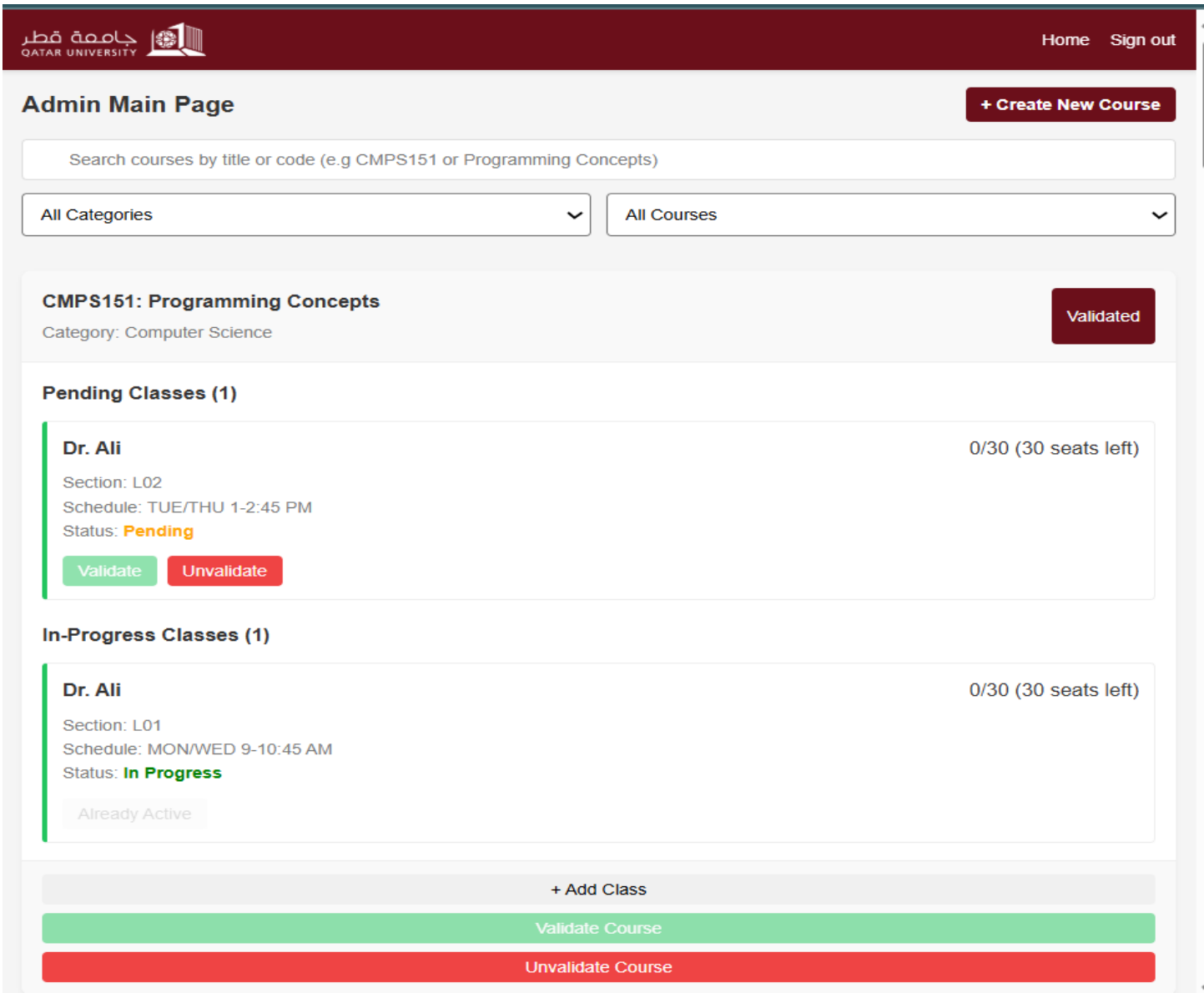


4.5. Use case 5

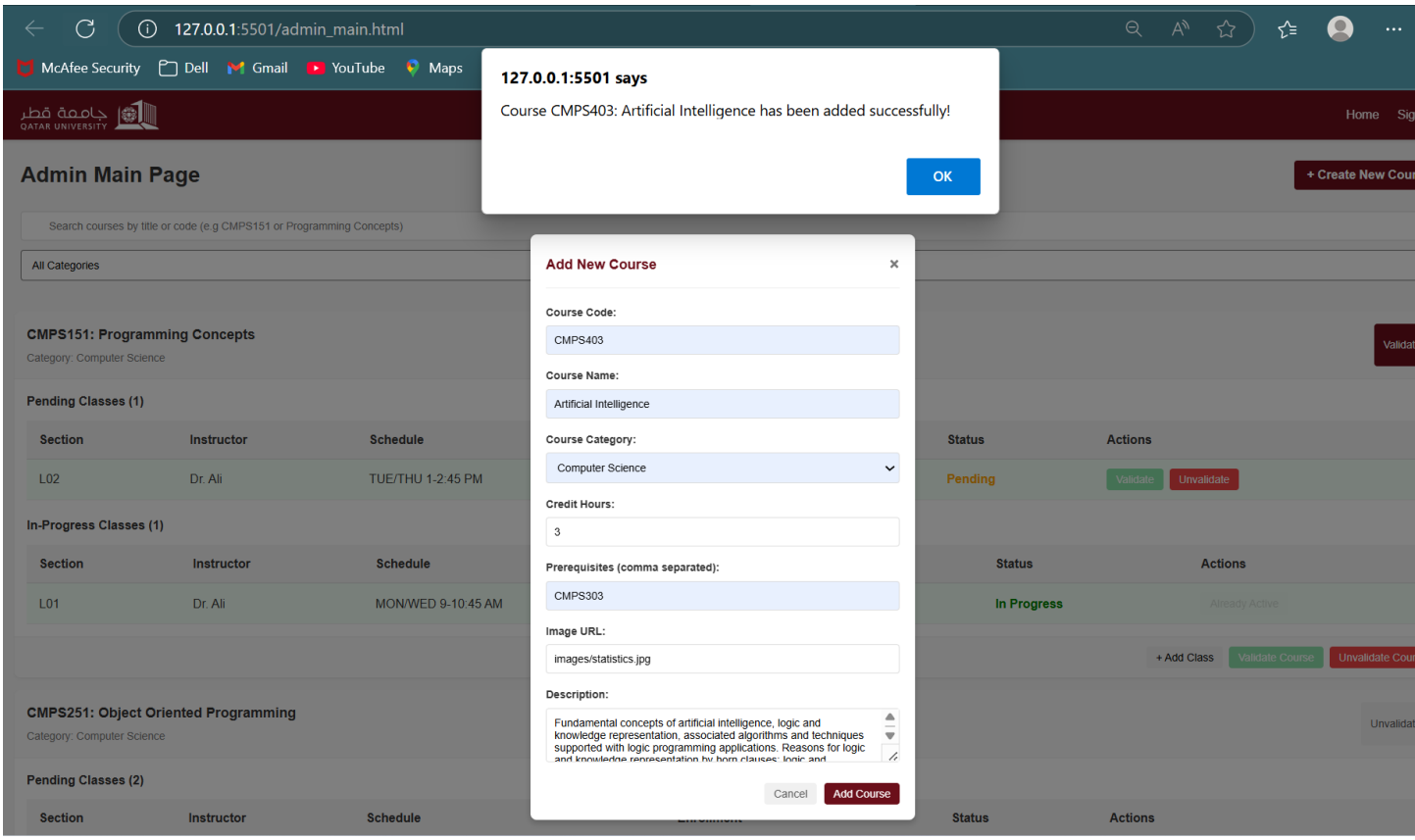
1. Desktop view



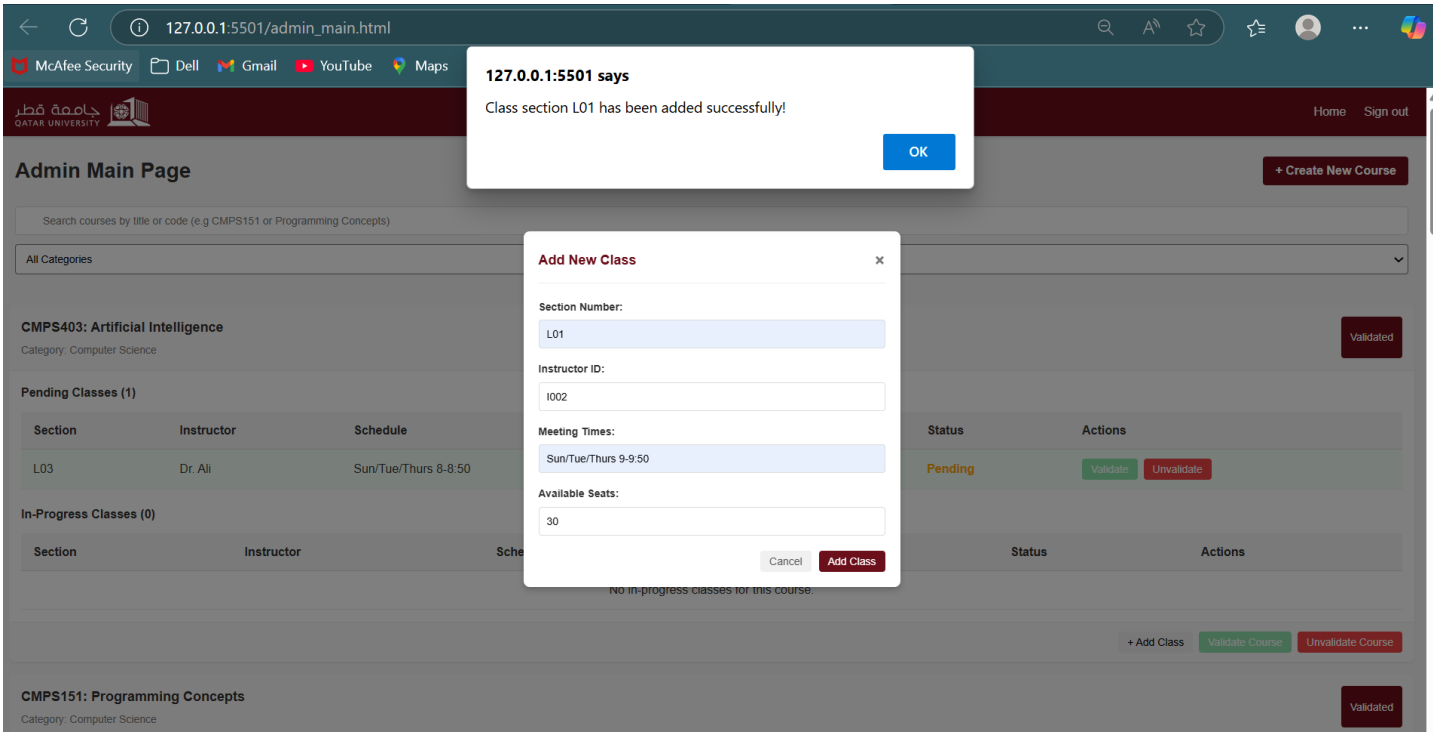
2. Mobile view



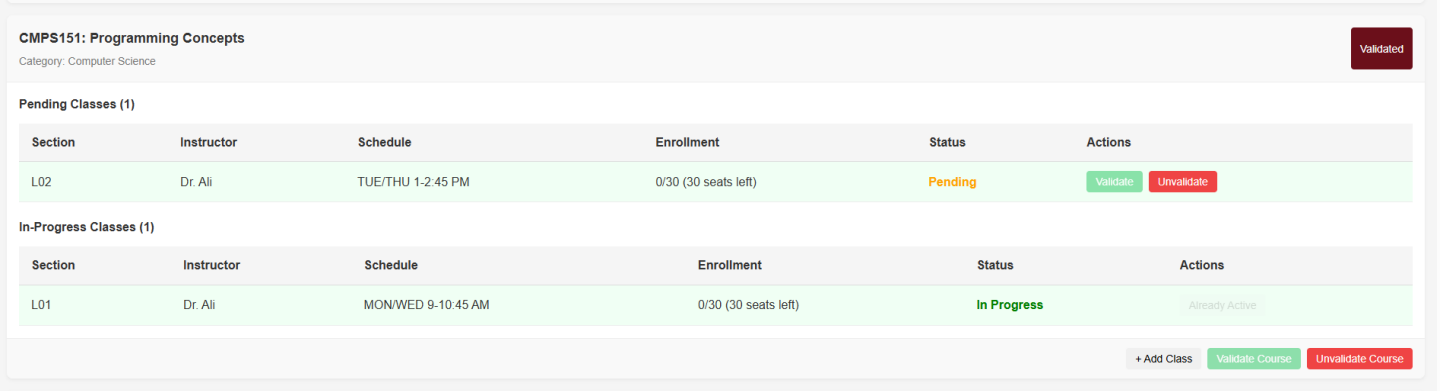
3. Add course



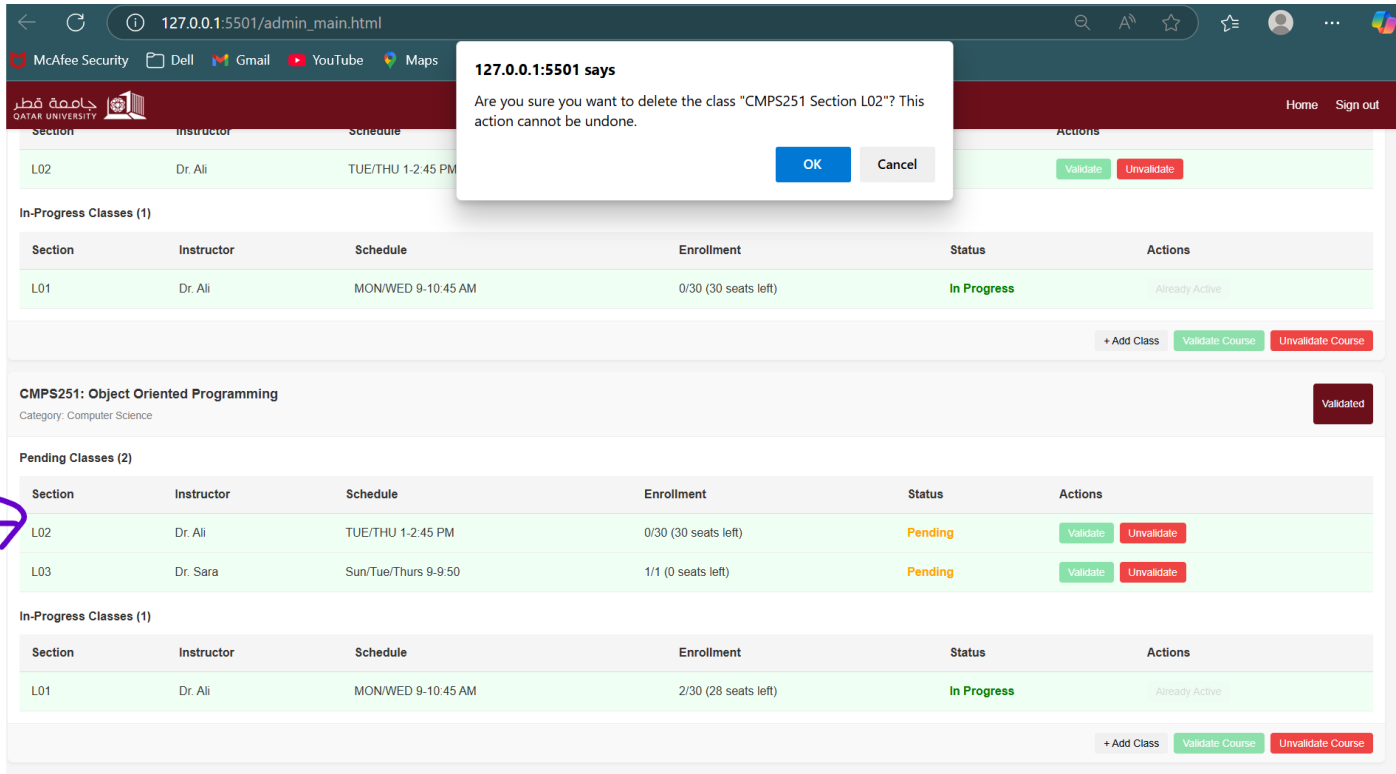
4. Add class to a course



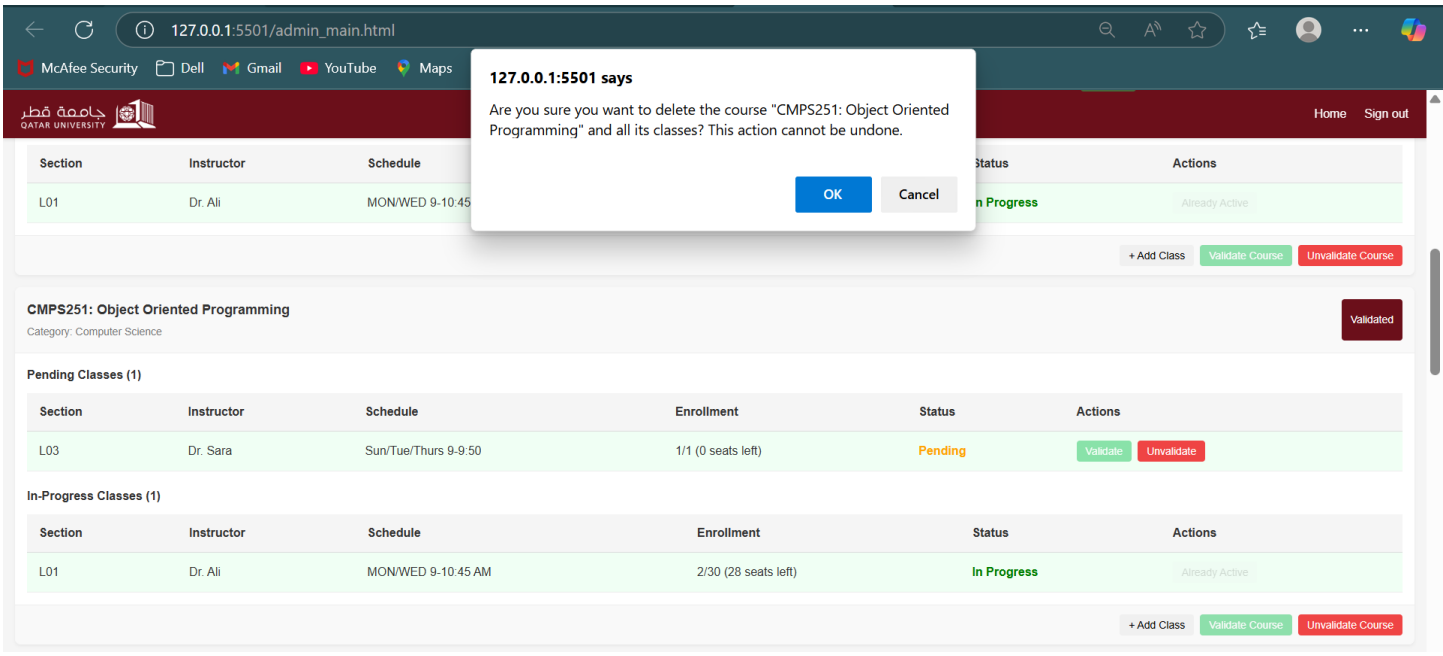
5. Validate course/ section



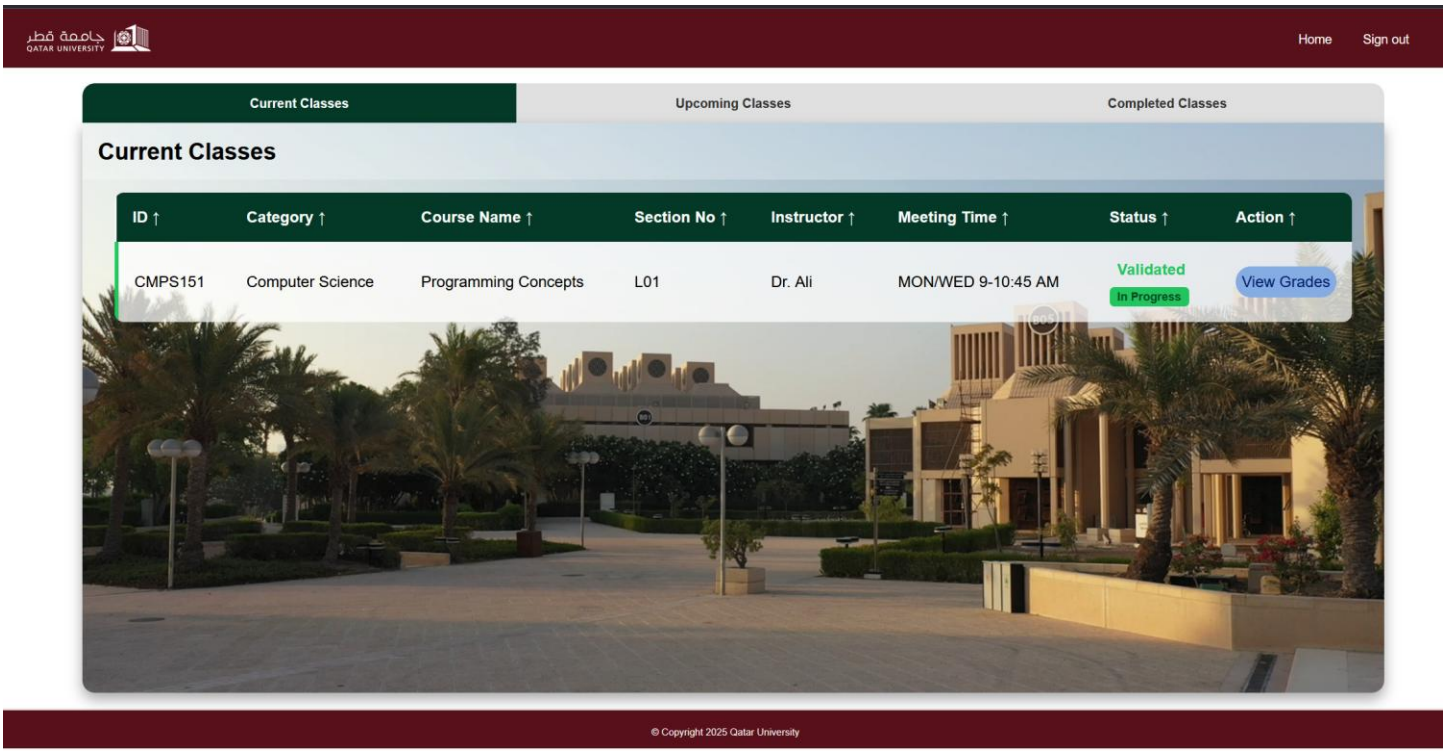
6. Invalidate section

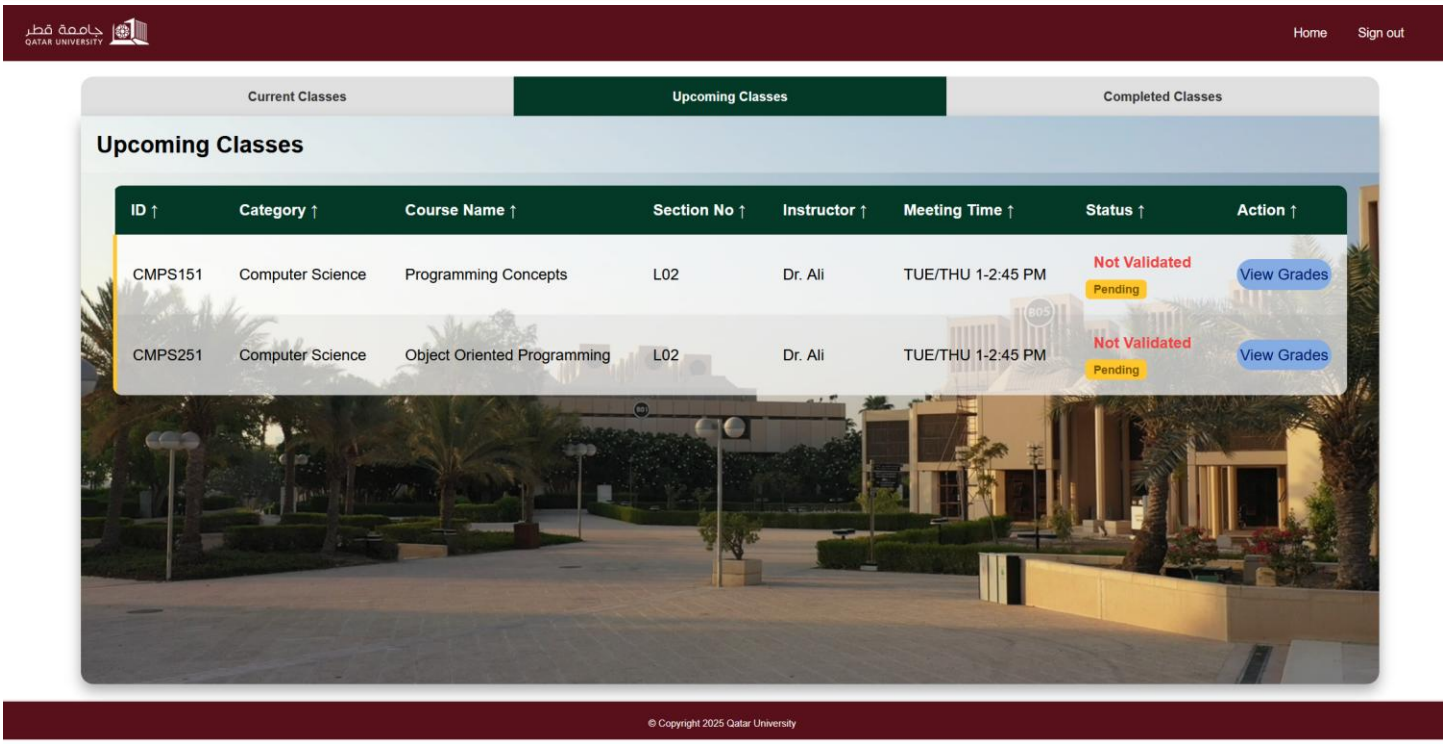


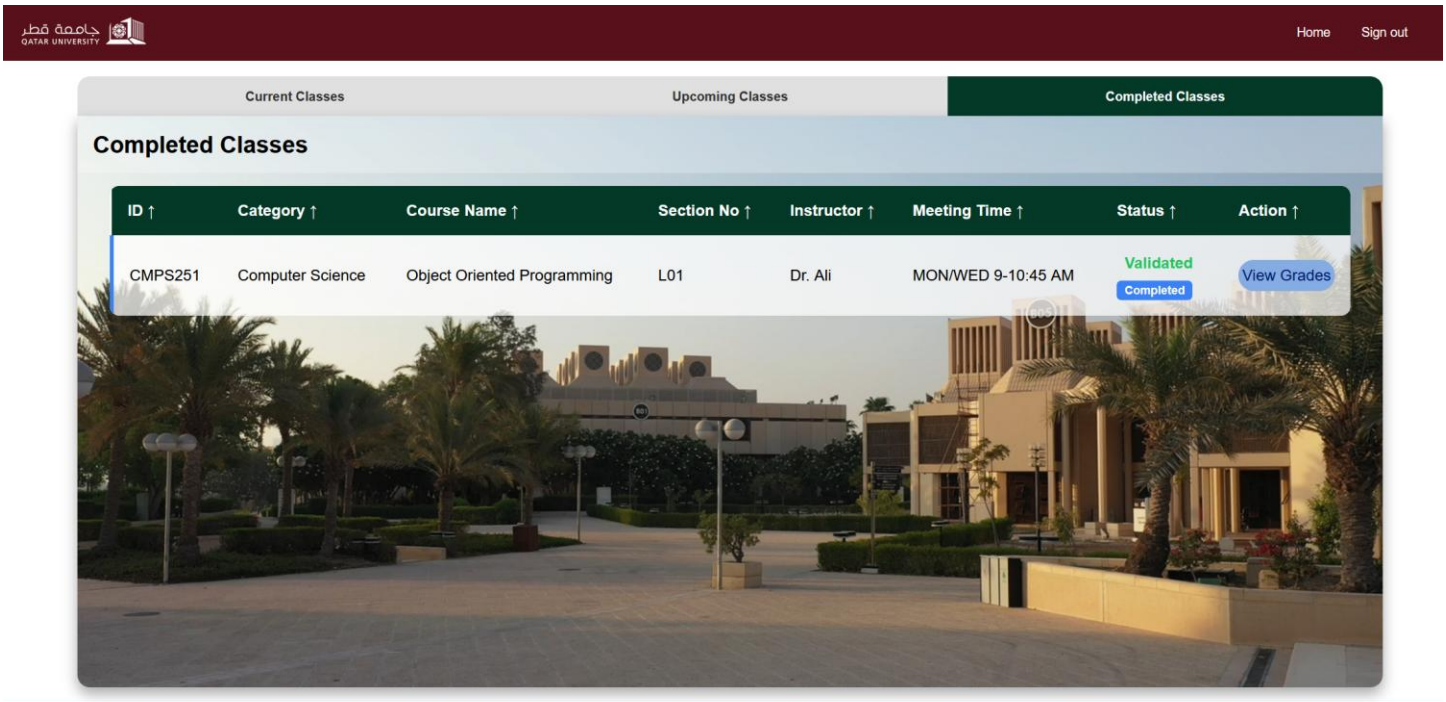
7. Invalidate course

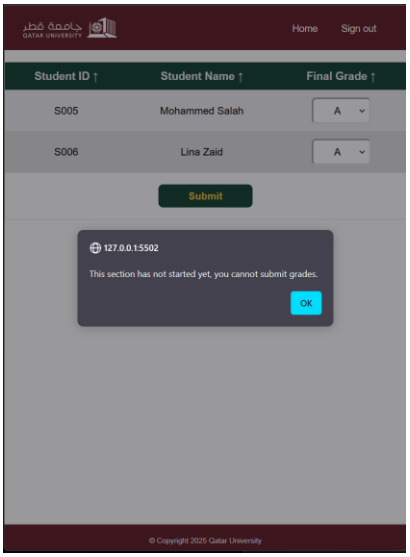

127.0.0.1:5501/admin_main.html
McAfee Security
Dell
Gmail
YouTube
Maps
127.0.0.1:5501 says
Are you sure you want to delete the course "CMPS251: Object Oriented Programming" and all its classes? This action cannot be undone.
OK
Cancel
Home
Sign out
Section
Instructor
Schedule
Status
Actions
L01
Dr. Ali
MON/WED 9-10:45
In Progress
Already Active
+ Add Class
Validate Course
Unvalidate Course
CMPS251: Object Oriented Programming
Category: Computer Science
Validated
Pending Classes (1)
Section
Instructor
Schedule
Enrollment
Status
Actions
L03
Dr. Sara
Sun/Tue/Thurs 9-9:50
1/1 (0 seats left)
Pending
Validate
Unvalidate
In-Progress Classes (1)
Section
Instructor
Schedule
Enrollment
Status
Actions
L01
Dr. Ali
MON/WED 9-10:45 AM
2/30 (28 seats left)
In Progress
Already Active
+ Add Class
Validate Course
Unvalidate Course

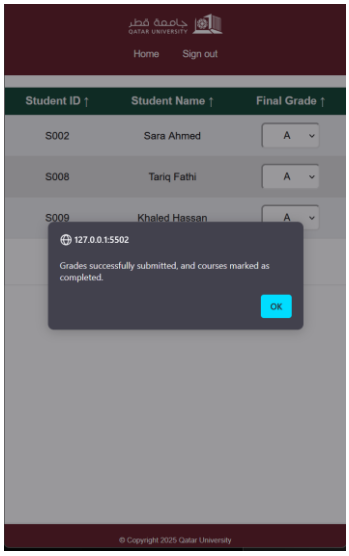
4.6. Use case 6

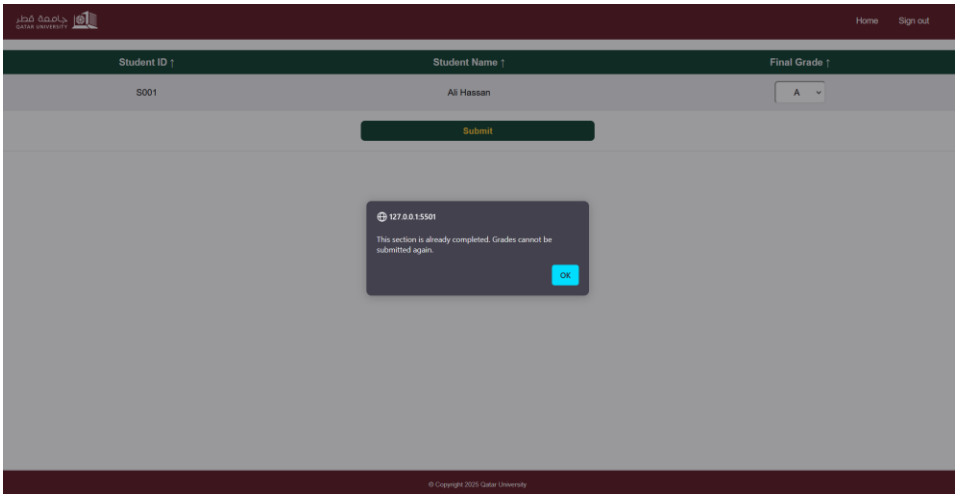

جامعة قطر
QATAR UNIVERSITY
Home
Sign out
Current Classes
Upcoming Classes
Completed Classes
Current Classes
ID ↑
Category ↑
Course Name ↑
Section No ↑
Instructor ↑
Meeting Time ↑
Status ↑
Action ↑
CMPS151
Computer Science
Programming Concepts
L01
Dr. Ali
MON/WED 9-10:45 AM
Validated
In Progress
View Grades
© Copyright 2025 Qatar University


جامعة قطر
QATAR UNIVERSITY
Home
Sign out
Current Classes
Upcoming Classes
Completed Classes
Upcoming Classes
ID ↑
Category ↑
Course Name ↑
Section No ↑
Instructor ↑
Meeting Time ↑
Status ↑
Action ↑
CMPS151
Computer Science
Programming Concepts
L02
Dr. Ali
TUE/THU 1-2:45 PM
Not Validated
Pending
View Grades
CMPS251
Computer Science
Object Oriented Programming
L02
Dr. Ali
TUE/THU 1-2:45 PM
Not Validated
Pending
View Grades
© Copyright 2025 Qatar University


جامعة قطر
QATAR UNIVERSITY
Home
Sign out
Current Classes
Upcoming Classes
Completed Classes
Completed Classes
ID ↑
Category ↑
Course Name ↑
Section No ↑
Instructor ↑
Meeting Time ↑
Status ↑
Action ↑
CMPS251
Computer Science
Object Oriented Programming
L01
Dr. Ali
MON/WED 9-10:45 AM
Validated
Completed
View Grades
© Copyright 2025 Qatar University


جامعة قطر
QATAR UNIVERSITY
Home
Sign out
Student ID ↑
Student Name ↑
Final Grade ↑
S005
Mohammed Salah
A
S006
Lina Zaid
A
Submit
127.0.0.1:5502
This section has not started yet, you cannot submit grades.
OK
© Copyright 2025 Qatar University


جامعة قطر
QATAR UNIVERSITY
Home
Sign out
Student ID ↑
Student Name ↑
Final Grade ↑
S002
Sara Ahmed
A
S008
Tariq Fathi
A
S009
Khaled Hassan
A
127.0.0.1:5502
Grades successfully submitted, and courses marked as completed.
OK
© Copyright 2025 Qatar University


جامعة قطر
QATAR UNIVERSITY
Home
Sign out
Student ID ↑
Student Name ↑
Final Grade ↑
S001
Ali Hassan
A
Submit
127.0.0.1:5501
This section is already completed. Grades cannot be submitted again.
OK
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