

# Online Course Registration System

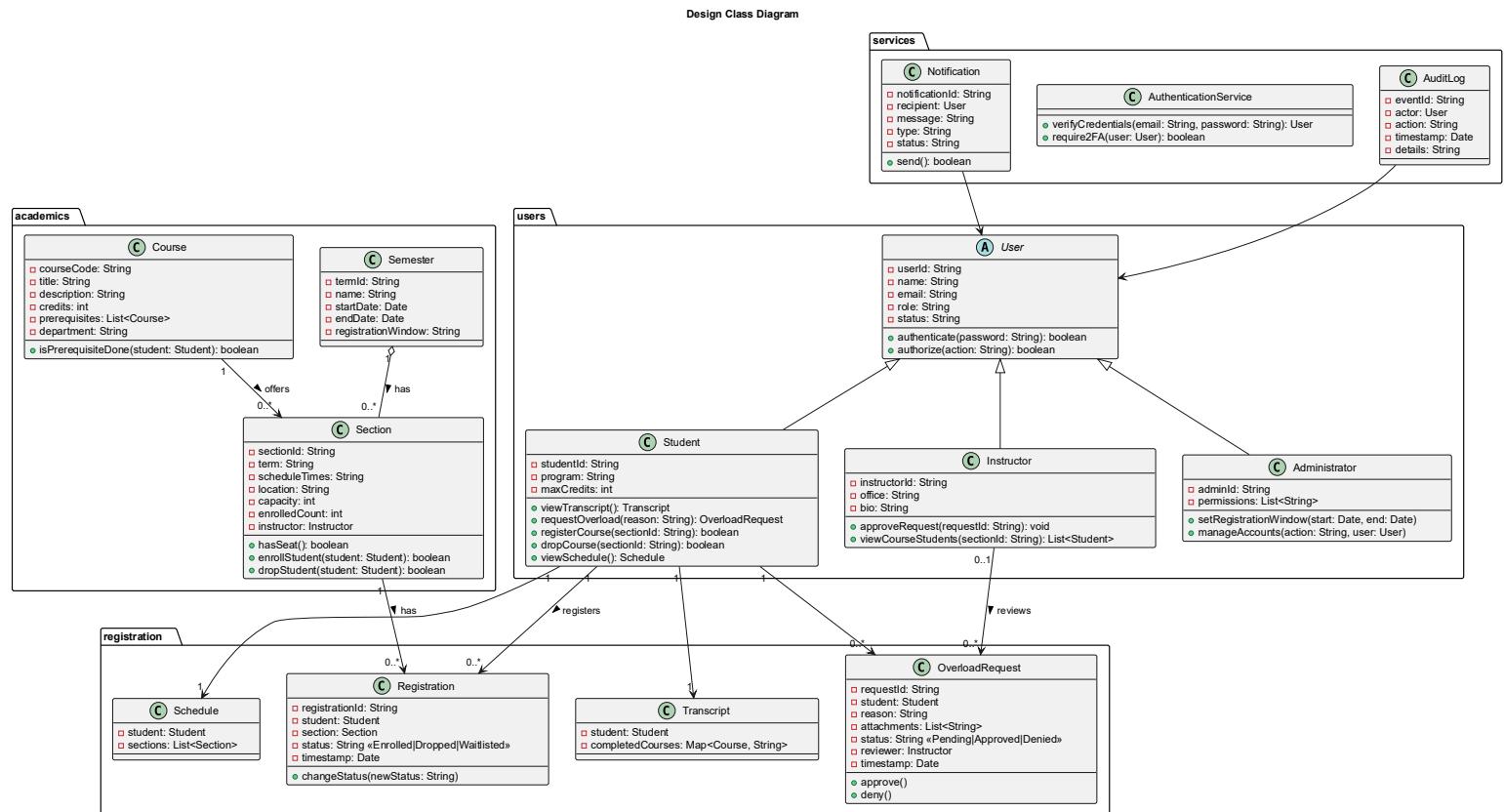
SW301 - Course Project – Phase 3 - System Design

Ahmed Wael 202201415

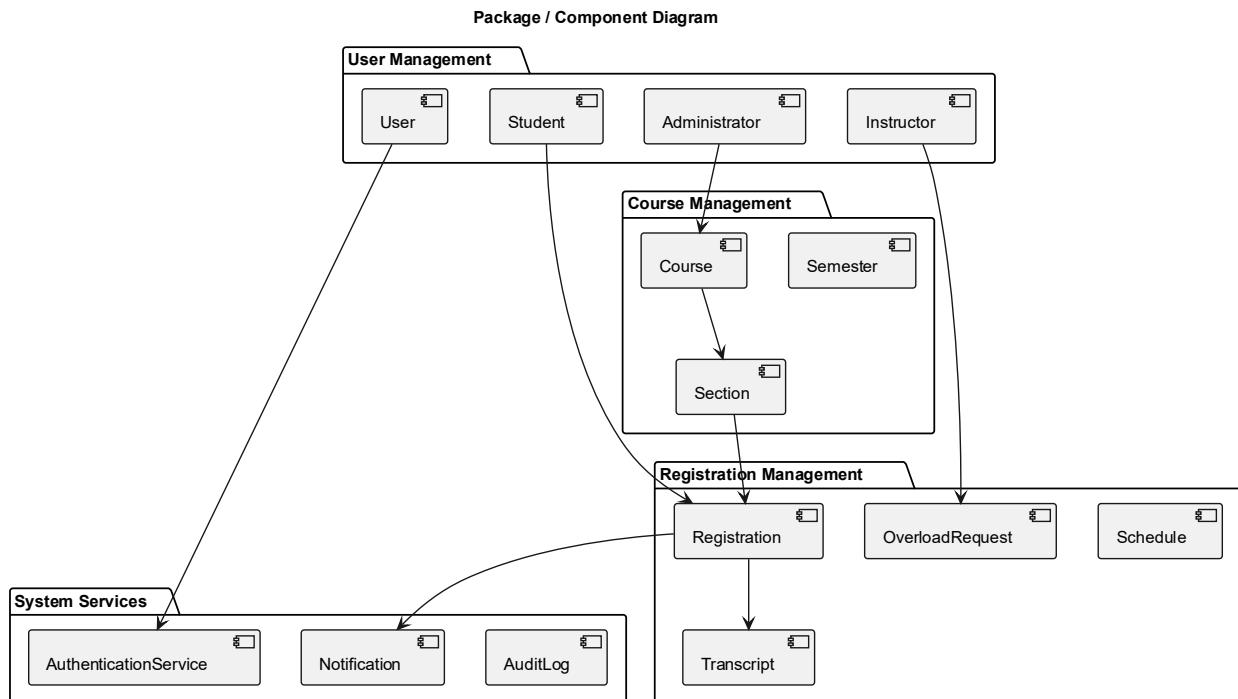
Ahmed Sameh 202202151

Seif Eldin 202201510

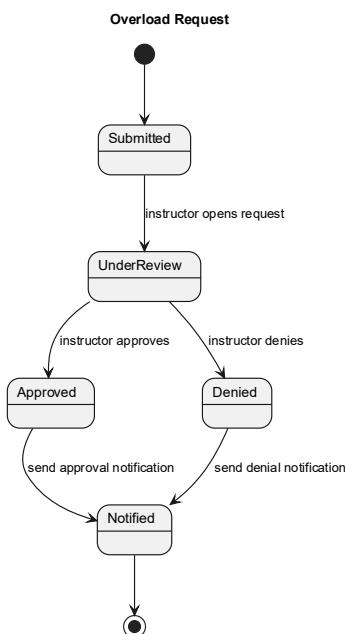
## Design Class Diagram



# Package / Component Diagram



# State Machine Diagram



# UI Mockups

Dashboard

Course Catalog

Request Overload

 Register for Courses  
Browse and enroll

 Drop Courses  
Manage enrollment

 Request Overload  
Exceed credit limit

 Spring 2025 Schedule

Total Credits: 14

**CS 301** • Data Structures

Section 001 • Dr. Sarah Williams

⌚ MWF 10:00 AM - 11:00 AM ⏺ Engineering Hall 201

3 credits

**MATH 250** • Calculus II

Section 003 • Prof. Michael Chen

⌚ TTh 2:00 PM - 3:30 PM ⏺ Mathematics Building 105

4 credits

**ENG 201** • Technical Writing

Section 002 • Dr. Jennifer Brown

⌚ MWF 1:00 PM - 2:00 PM ⏺ Liberal Arts 302

3 credits

**PHYS 201** • Physics I

Section 001 • Dr. Robert Taylor

⌚ TTh 9:00 AM - 10:30 AM ⏺ Science Center 410

4 credits

 Notifications

⌚ Registration for Fall 2025 opens on April 15th  
2 hours ago

⌚ CS 301 lecture moved to Engineering Hall 203  
on March 15th  
5 hours ago

⌚ Your overload request for PHIL 101 is pending  
approval  
1 day ago

## Academic Summary

Current GPA **3.72**

Credits Completed **78**

Credits Enrolled **14**

Dashboard

Course Catalog

Request Overload

 Find Courses

 CS 401

Department

Credits

Term

All Departments

All Credits

All Terms

Showing 1 course

**CS 401** Advanced Algorithms

3 credits

Computer Science • Fall 2025

Advanced study of algorithm design and analysis techniques including divide-and-conquer, dynamic programming, greedy algorithms, and graph algorithms.

Section 001 Dr. Sarah Williams

⌚ MWF 10:00 AM - 11:00 AM ⏺ Engineering Hall 201 ⚡ 35/40 (2 waitlisted)

⌚ 5 left

Section 002 Dr. Michael Park

⌚ TTh 2:00 PM - 3:30 PM ⏺ Engineering Hall 305 ⚡ 40/40 (5 waitlisted)

⌚ Full

**View Details & Register**

Assigned Sections  3

Total Students  103

Pending Requests  1

Waitlisted  7

**Assigned Sections**

- CS 401** • Advanced Algorithms Section 001  
Fall 2025  
 MWF 10:00 AM - 11:00 AM  Engineering Hall 201 Enrollment 35/40 +2 waitlist
- CS 301** • Data Structures Section 002  
Fall 2025  
 TTh 2:00 PM - 3:30 PM  Engineering Hall 305 Enrollment 40/40 +5 waitlist
- CS 201** • Introduction to Programming Section 001  
Fall 2025  
 MWF 1:00 PM - 2:00 PM  Computer Science Building 110 Enrollment 28/35

**Pending Overload Requests** 1 pending

- Sarah Johnson S12345678 GPA: 3.85 3/10/2025  
CS 401 - Advanced Algorithms (Section 001)  
Current: 15 credits → Requested: +3 credits → Total: 18 credits  
Reason: I am on track to graduate in Spring 2026 and need this course to complete my degree requirements. I have maintained a strong GPA and have successfully...

**Recently Processed**

- Michael Chen S87654321 3/8/2025   
CS 401 - Section 001
- Emily Rodriguez S11223344 3/5/2025   
CS 301 - Section 002

# Summary

## Design Approach

The system design follows object-oriented principles by refining the conceptual classes into a full design model. Each class includes specific attributes, data types, methods, and defined relationships, making the structure ready for implementation.

## **Key Design**

### **1. Layered Package Structure**

The system was divided into packages to separate responsibilities:

- User Management handles authentication and user roles
- Course Management maintains the academic catalog
- Registration Management processes student enrollment
- System Services manages notifications, logs, and authentication

### **2. Refined Class Details**

Attributes now include explicit data types.

Methods are defined for the behaviors needed to support workflows.

### **3. Navigability and Multiplicity**

Relationships now specify direction and cardinality (1..\*, 0..1).

This ensures correct data traversal and prevents invalid associations.

### **4. State-Driven Behavior**

Registration is modeled with a State Machine because it moves through states like Pending, Enrolled, Dropped, and Denied.

### **5. Service Abstraction**

Components such as Notification, AuditLog, and AuthenticationService were isolated to support reuse across different modules.

### **6. UI Design Principle**

UI screens are grouped by user roles (Student, Instructor, Administrator) to simplify navigation and reduce complexity for each type of user.