

## Object of Activity: University

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## System Requirements

### Functional Requirements:

1. Management of student data (registration, update, deletion).
2. Monitoring student progress (grades, exams).
3. Management of class schedules.
4. Automation of the library system and book management.
5. Interaction with dormitories for room assignment and student distribution.
6. Reporting for administration (statistics on performance, teacher workloads).

### Non-functional Requirements:

1. High performance with data processing within 1 second for any operation.
  2. Scalability to handle up to 10,000 active users.
  3. Data protection from unauthorized access (encryption, authentication, logging).
  4. User-friendly interface (intuitive, adaptive for different devices).
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## Use Cases

1. **Student Registration:** The administrator adds student data to the system. The student confirms access through their profile.
  2. **Class Enrollment:** The student selects subjects and enrolls in classes through the portal.
  3. **Gradebook Control:** Teachers record results, and students can view their results online.
  4. **Dormitory Management:** Administrators can assign rooms and update available spots.
  5. **Library:** Students and teachers can reserve books and request digital versions.
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## Objects, Classes, and Relationships

### Objects:

- Student
- Teacher
- Course
- Dormitory
- Library
- Transactions

## Classes and Relationships:

- **Student:** id, name, courses, grades, dormRoom, transactions.
  - **Teacher:** id, name, subject, schedule.
  - **Course:** id, name, teacher, schedule.
  - **Library:** id, books, transactions.
  - **Dormitory:** id, rooms, students.
  - **Transaction:** id, student, book, issueDate, returnDate.
  - **Book:** id, title, author, isAvailable, transactionHistory.
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## CRC Cards

### Student

- **Responsibilities:**
  - Register in the system.
  - View and manage their profile.
  - Enroll in classes.
  - Check grades and academic progress.
- **Collaborators:**
  - Course (enrolled in courses).
  - Dormitory (assigned to a dormitory).
  - Library (borrows books).
  - Transaction (tracks library operations).

### Teacher

- **Responsibilities:**
  - Create and manage courses.
  - Grade students.
  - Conduct classes.
- **Collaborators:**
  - Course (teaches courses).
  - Student (grades students).

### Course

- **Responsibilities:**
  - Manage schedules.
  - Store information about students and teachers.
- **Collaborators:**
  - Teacher (teaches courses).
  - Student (students are enrolled).

### Library

- **Responsibilities:**

- Manage books.
  - Handle transactions for book issuance and returns.
- **Collaborators:**
  - Student (borrows books).
  - Transaction (tracks issuance and return).
  - Book (involved in transactions).

## Dormitory

- **Responsibilities:**
  - Manage rooms.
  - Assign students to rooms.
- **Collaborators:**
  - Room (manages rooms).
  - Student (lives in rooms).

## Transaction

- **Responsibilities:**
    - Track book issuance to students.
    - Store return information.
  - **Collaborators:**
    - Library (holds transactions).
    - Student (involved in transactions).
    - Book (issued or returned).
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## Class Diagram



