

Introduction and Motivation

Almost everything in this world is getting closer to being modernized. Education system also goes with this flow. In a country like Bangladesh, there is a huge gap regarding facilities in the education system. For instance, urban schools, colleges provide many facilities to students. While talking about universities, the world's top ranked universities have maintained their courses online from long ago. Mostly, from Covid-19 pandemic, Bangladesh is suffering the biggest longtime educational institutional closure in the world. Many educational institutions do not have a proper learning system where they can teach all the courses and mostly can take exams. There have already been many learning platforms in Bangladesh such as Bohubrihi, Ghoori learning but they can not provide a holistic learning system that a university or school college needs. Many educational institutions are concerned about taking exams online in a fair way. If we look at the current systems that allow online education, they are barely able to fulfill one of the key requirements of a fair exam that is proctored exam. After discerning this fact, we have come up with the idea that we will ensure this feature.

Moreover, it will not only be able to feature proctored exams but also it will provide some important requirements like giving the opportunity to students for viewing their progress, course materials. These are the basic requirements of an online education platform. Apart from these, what it will be able to solve is making sure that no students can use any unethical means in the exam without being caught. As the exam is going to be proctored and the recorded video will be uploaded in the google drive, teachers can easily recheck the recorded video if they find anything suspicious. This will prevent most of the students from cheating in the exams.

Finally, we are building this system thinking about the future and where it will stand in the future market. While mentioning that everything will be modernized, we were referring to the future. Online education is now an inevitable fact and most of the universities are providing their courses in various online platforms. As everything evolves, we will also update our system to meet the upcoming requirements but for the near future it has already been up to date.

System Request - Online Learning Platform (OLP) Project

Project Sponsor: Tahmid Nizam Ibnul

Business Need:

Due to the lack of a proper learning platform with sophisticated exam systems, a new platform should be built which can ensure proctored exams to prevent students from using any unfair means in the exam. Moreover, this system will enable any institution to conduct their academic session more effectively and efficiently by providing all the course materials, assignments, discussion forum which is much needed in this pandemic situation in Bangladesh.

Business Requirements:

Using the Learning Platform, teachers can teach by uploading course materials so that the students can study and learn from those by enrolling in the courses. The certain features that are included in the systems are given below:

- Registration for both teachers and students
- Timer Based exam system
- Proctored exam with the facility of uploading recorded video in the platform database
- Discussion forum after each learning material
- Enhanced answer checking system
- Track of individual student progress
- Pre-Exam Reminder

Business Value:

- Estimated annual profit of around BDT 500000 by selling the system to educational institutions
- Satisfaction of the teachers on the way of taking the exam
- Timely exam will reduce year-loss

Special Issues or Constraints:

- Most of the teachers are not technically sound and so it will be difficult to get them used to this system.
- Persuading the educational institutions into using this online system

Requirement Analysis on Online Learning Platform

Functional Requirements:

1. Registration and Sign in options for everyone.
2. Proctored Exam.
3. Admins, teachers and respective students can see the Proctored exam videos that were automatically uploaded after the exam.
4. Everyone can Edit/Update their own password.

Admin:

1. Admins can add admins and teachers.
2. They can see who is enrolled in the system.
3. Admins can add courses, delete courses and update courses.

Teacher:

1. Teachers can add/customize course materials.
2. They can add/delete exams and update the exam date, set the exam the duration of the exam and can update.
3. Teachers can add exam questions, answers of the questions, delete questions, and update questions
4. They have the ability to make the answers visible.
5. They can retrieve student's results by student id.
6. Teachers can enroll students directly using student id.
7. They can see the enrolled students in a course.

Student:

1. There will be options for watching the progress for respective students.
2. Each Student will have an individual dashboard where they can see the course materials.
3. Students can attend the exams.
4. They can see the correct answers once the exam is finished.
5. Students cannot start exams without opening their camera.
6. Students can post about any inquiry/question regarding the topic in the discussion forum to get clarified.
7. They will get pre-exam notifications

Non-Functional Requirements:

1. Operational

- The system must be compatible with every browser.
- The system will remain current with evolving web standards.
- No special maintainability requirements are anticipated.
- The timer will be active while attending the exam.

2. Performance

- The system will be available 24/7.
- System should not take more than 1 second to respond.
- Keep record of Students data and course enrolment with enrolment date

3. Security

- Students must use their academic roll or id to register and login.
- One student can not see another student's information.
- Only admins can add/delete courses.

4. Cultural and Political:

- The system will be available in Bangla.
- Will maintain the regularities of the Ministry of Education.
- Students and teachers' data to be protected by following Digital Security ACT(DSA).

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    usecaseDiagram
        usecase UC1[Log in]
        usecase UC2[Register in]
        usecase UC3[Enroll in Courses]
        usecase UC4[see course materials]
        usecase UC5[Enroll students in course]
        usecase UC6[delete exam]
        usecase UC7[add exam]
        usecase UC8[make questions]
        usecase UC9[finish exam]
        usecase UC10[discuss topic]
        usecase UC11[Log out]
        usecase UC12[see own progress]
        usecase UC13[see the answers]
        usecase UC14[update course materials]
        usecase UC15[get exam reminder]
        usecase UC16[Add exam timer]
        usecase UC17[add answers]
        usecase UC18[retrieve student's result]
        usecase UC19[Record Video]
        usecase UC20[start timer]
        usecase UC21[stop timer]
        usecase UC22[store video]
        usecase UC23[verify password]
        usecase UC24[check valid user id]
        usecase UC25[add courses]
        usecase UC26[delete courses]
        usecase UC27[add admin]
        usecase UC28[add teacher]
        usecase UC29[delete questions]

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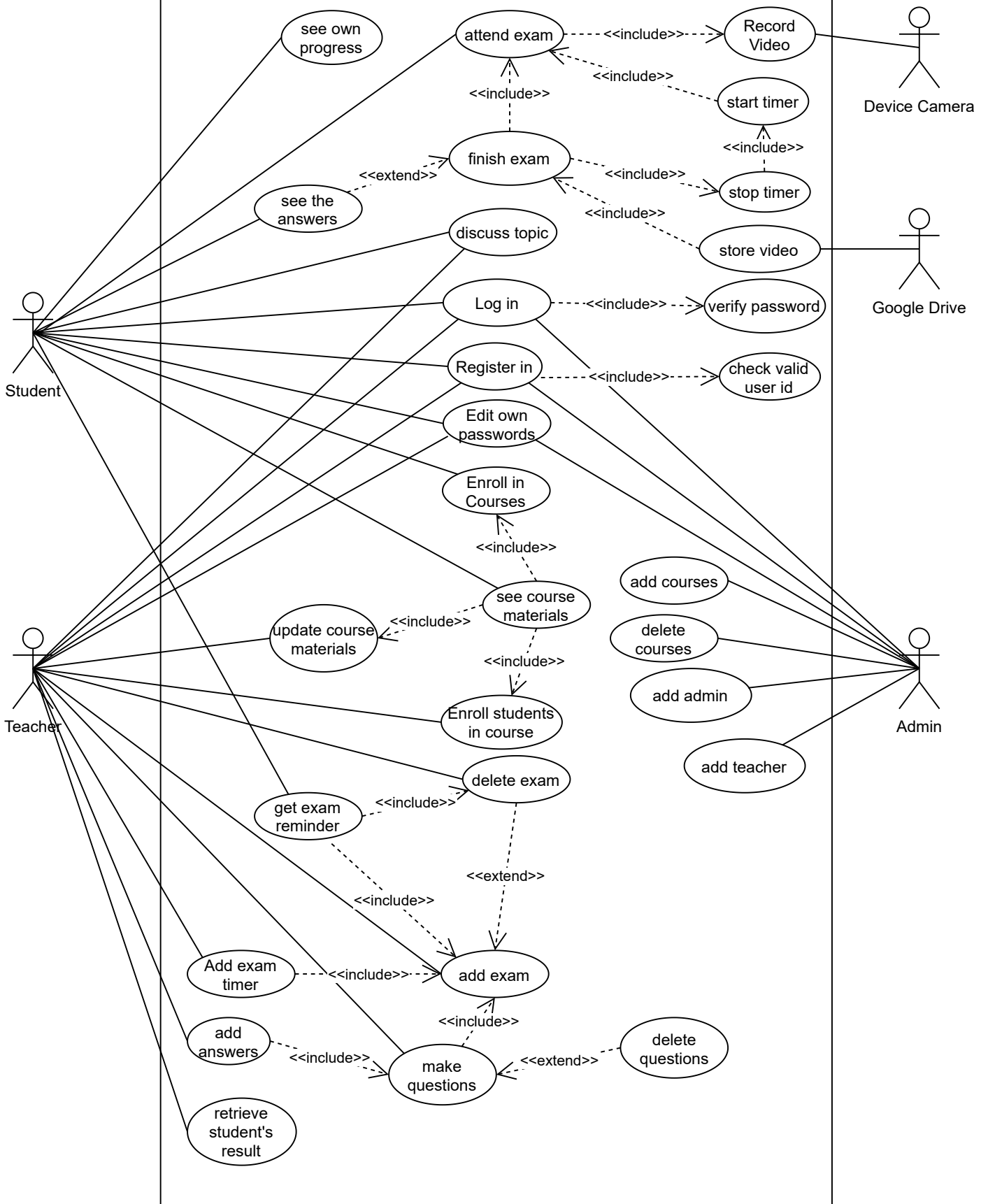
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Use Case Description

Actors:

Students: After registration, students can log in to see course materials, attend exams and get exam notifications. Before attending the exam, their device camera will be open and their recorded video will be saved in the google drive. They will be able to see a timer during the examination and after finishing the exam, they can see the answers of the questions. Moreover, they will be able to see their progress in the course.

Teachers: Teachers can either be added by the admins or they can register themselves. After registration, they will be able to login, add students to their courses. They can also add exams for those courses and add the time limit, set the questions and answers for the exams. They can also delete an exam/question if that is required.

Admins: They can add another admin and the teachers to the system. They are the only actors who can add or delete a course. They will maintain the database and look after the system.

Device Camera: It will start recording the video of the student once the student appears to attend the exam.

Google Drive: The recorded video of the exam will be stored in the google drive.

Relations:

Include: There are plenty of include relations in our use case diagram. Some of those are mentioned below:

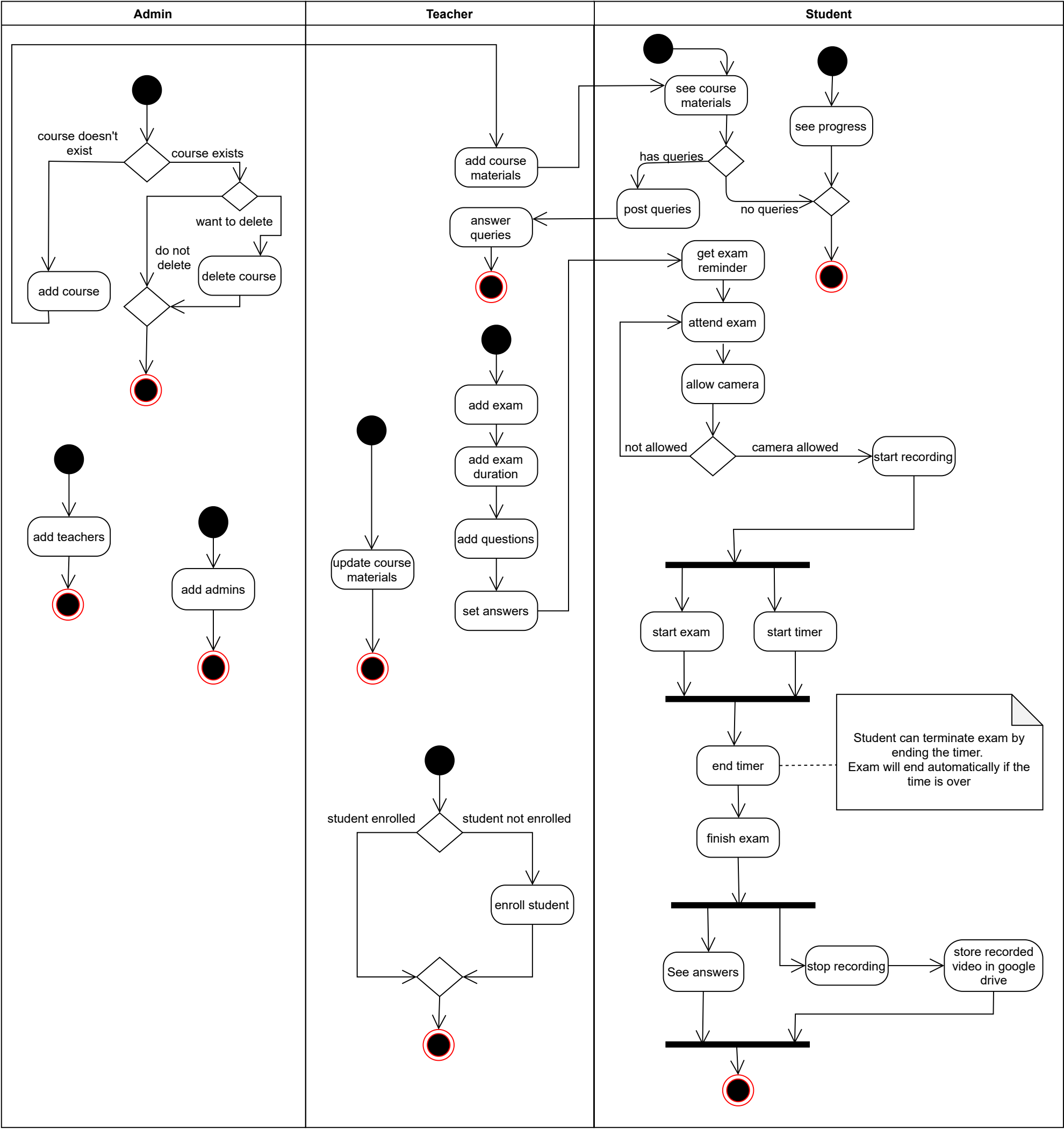
- Attend exam includes record video
- Finish exam includes attend exam
- See course materials includes update course materials

Extend: Some of the extend relations that we have used are:

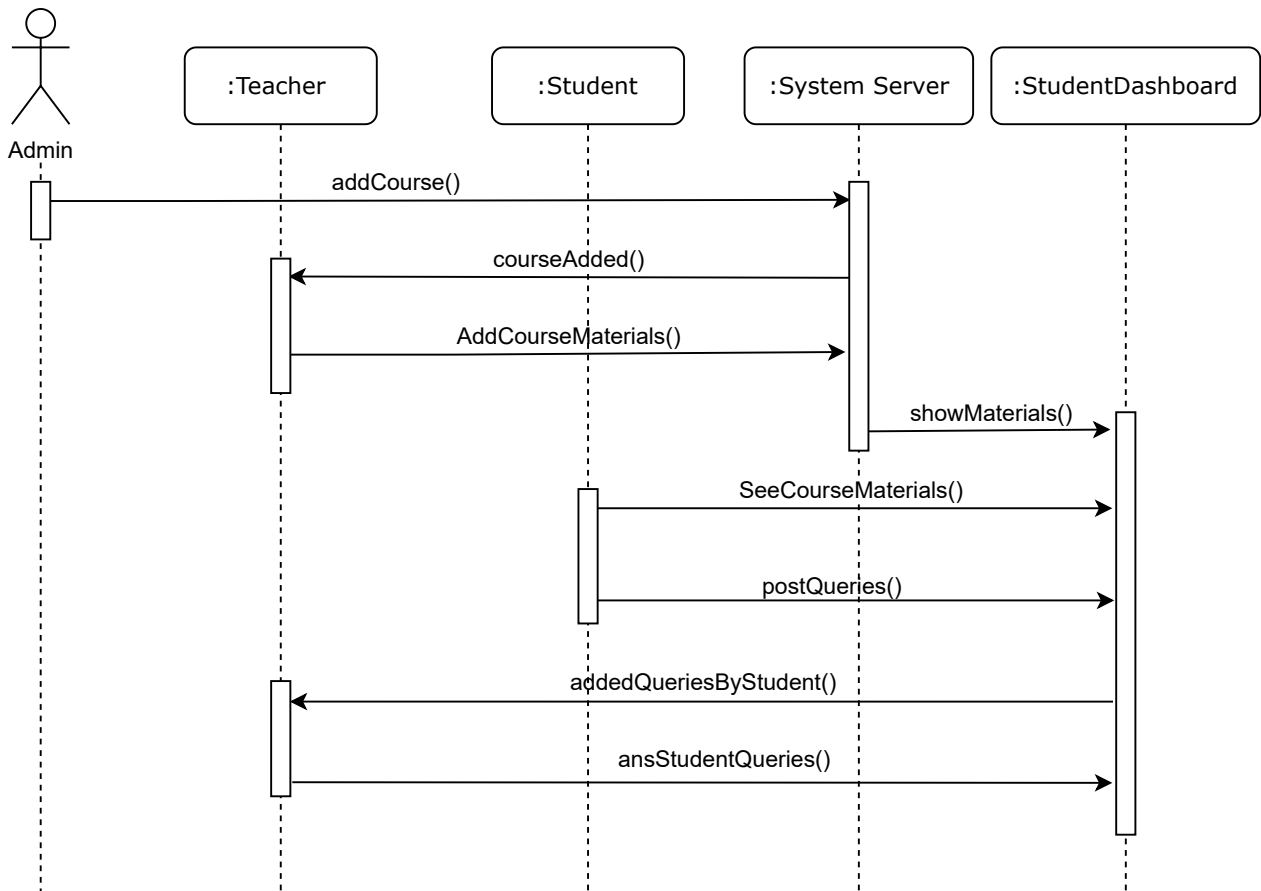
- Make questions extends delete questions
- Add exam extends delete exam
- Finish exam extends see the answers

Generalization: We haven't used generalization relation as the actors have only few things in common. As they differ much in their actions, we feel it is not necessary to generalize the users.

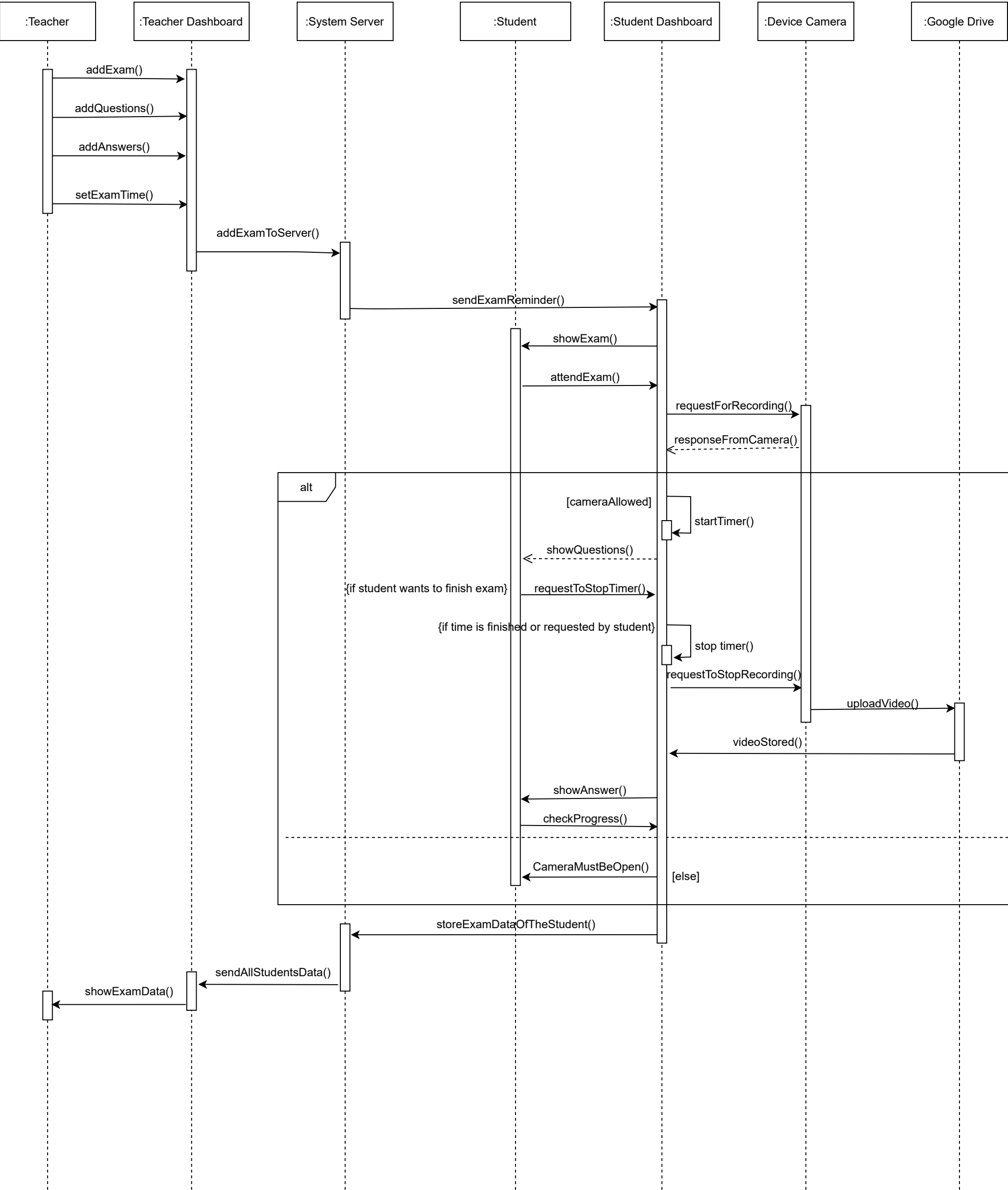
Activity Diagram for Online Learning Platform



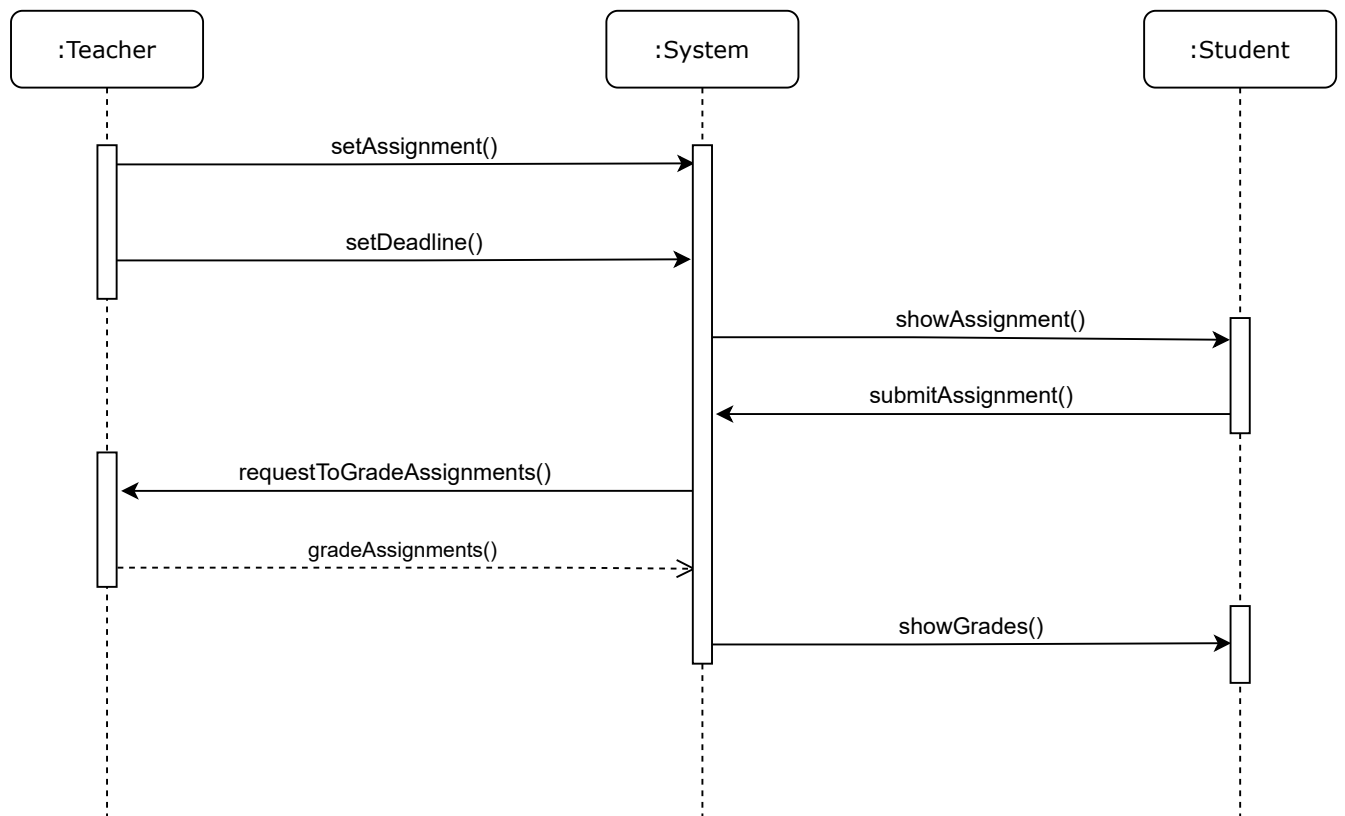
Sequence Diagram for Add Course



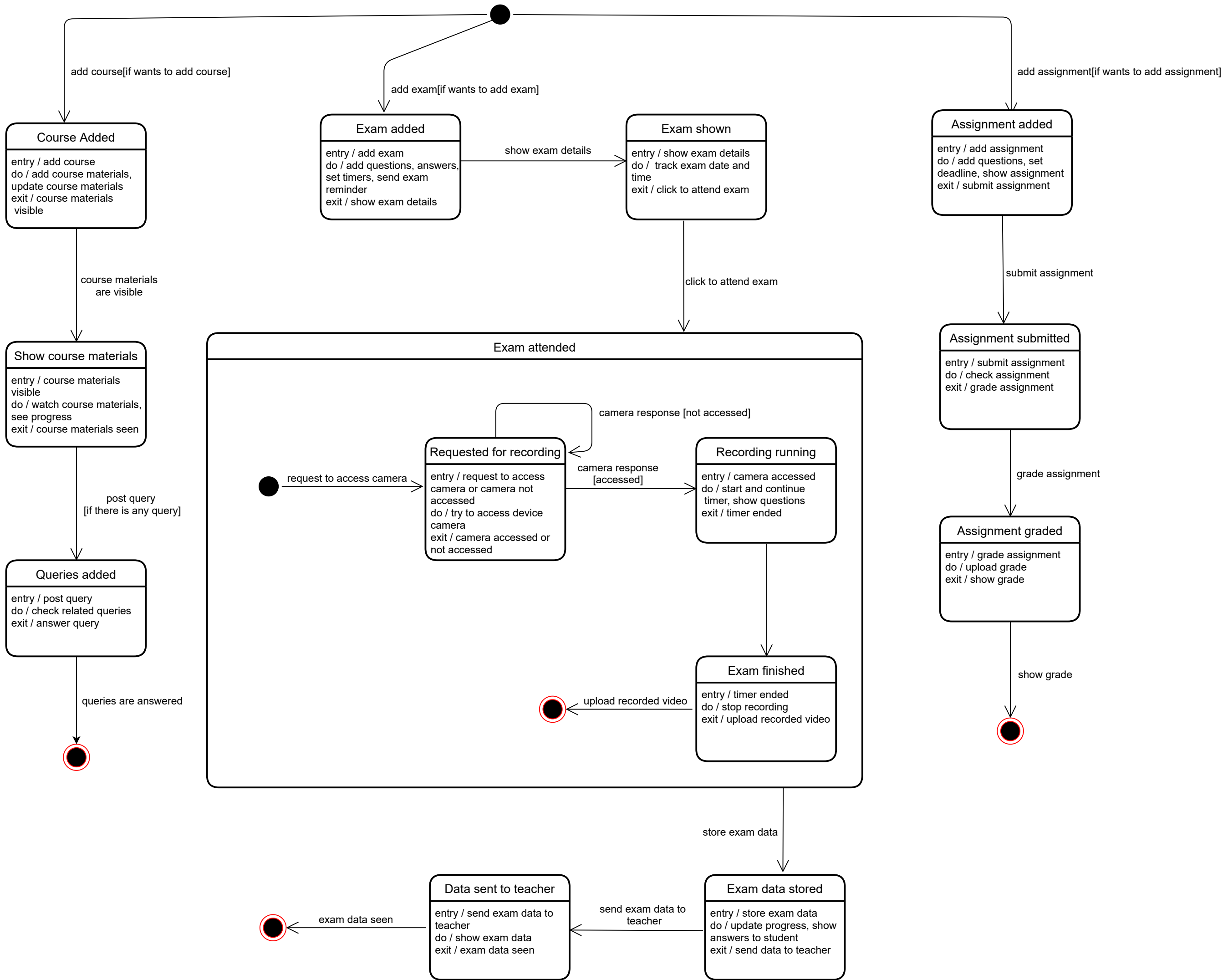
Sequence Diagram for Add Exam Use Case



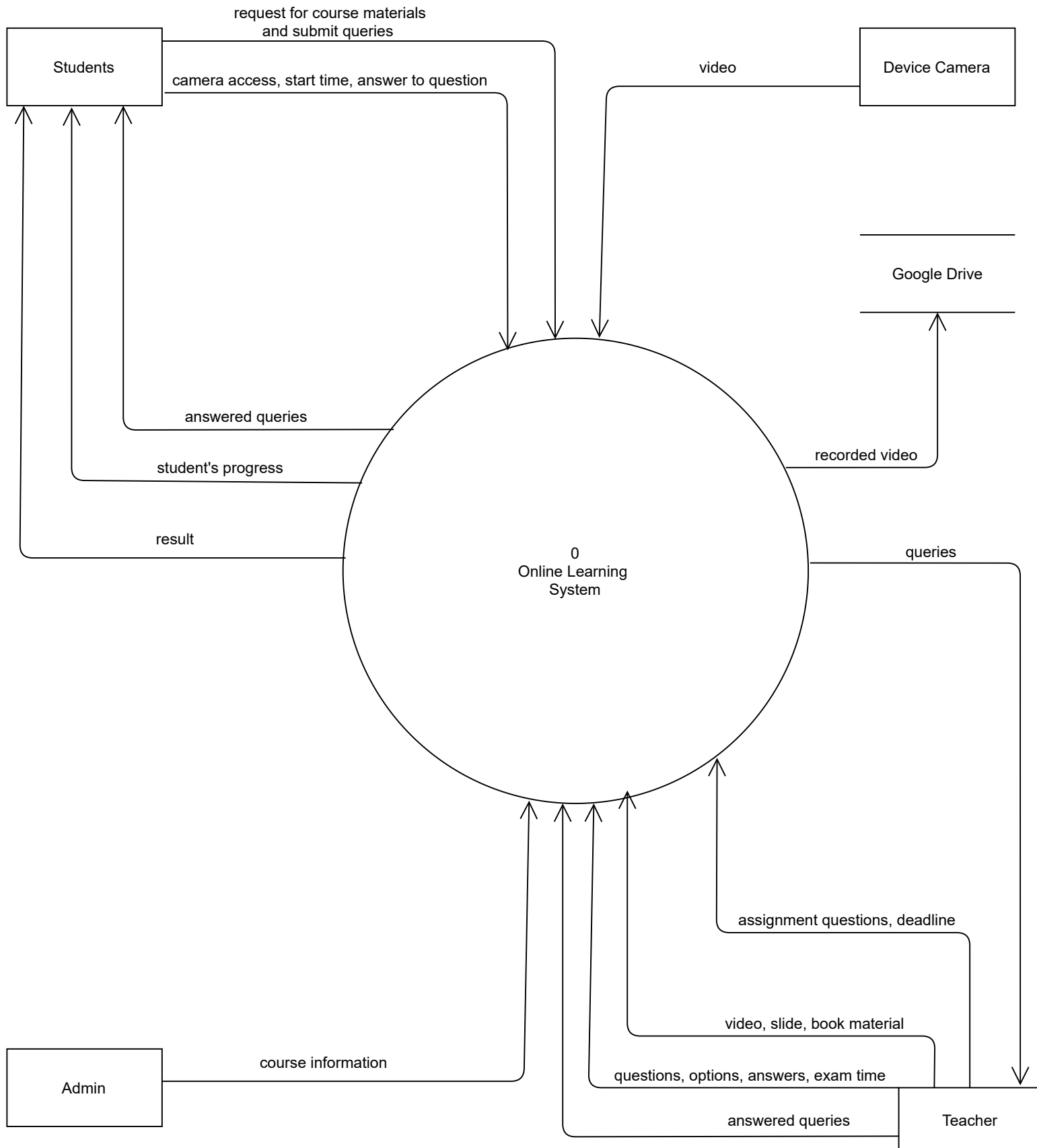
Sequence Diagram for Add Assignment Use Case



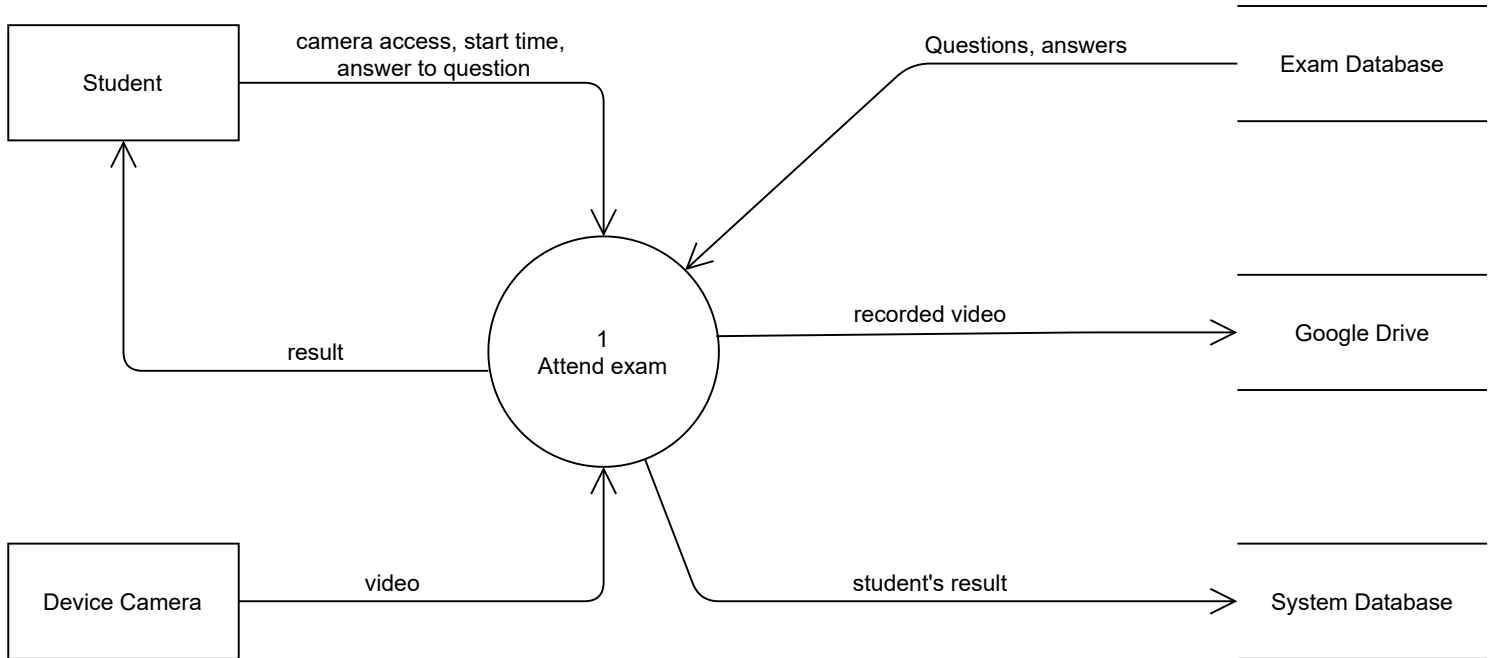
State Machine diagram



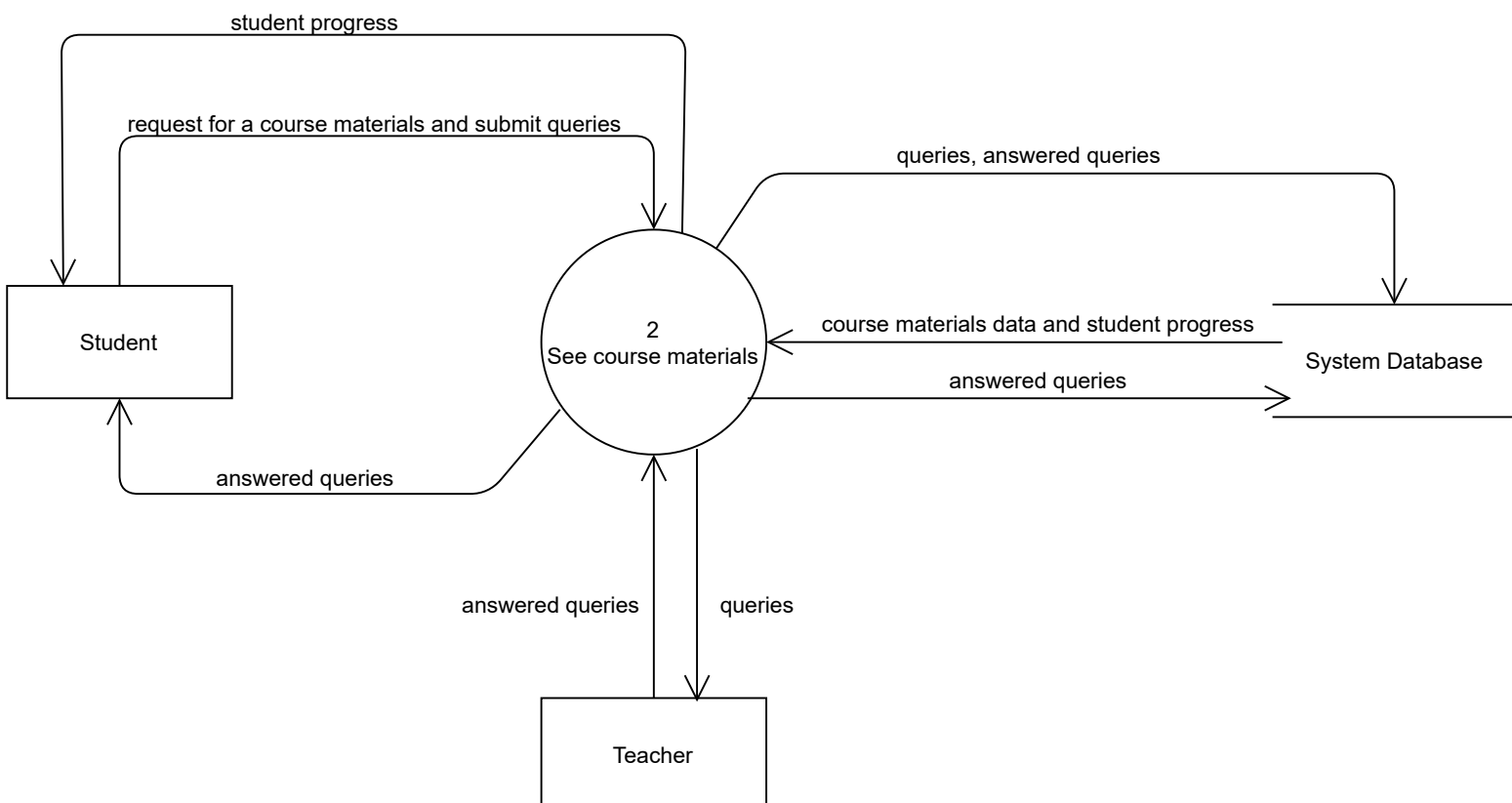
Level 0 diagram of Online Learning System Process



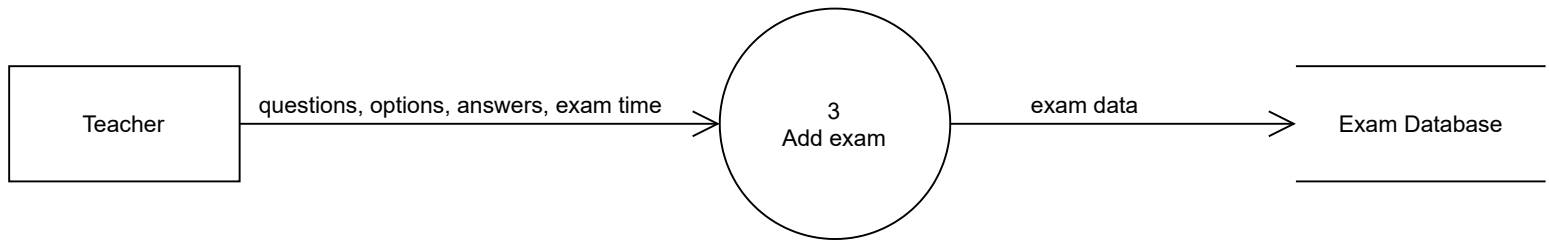
Level 1 diagram of Attend Exam process



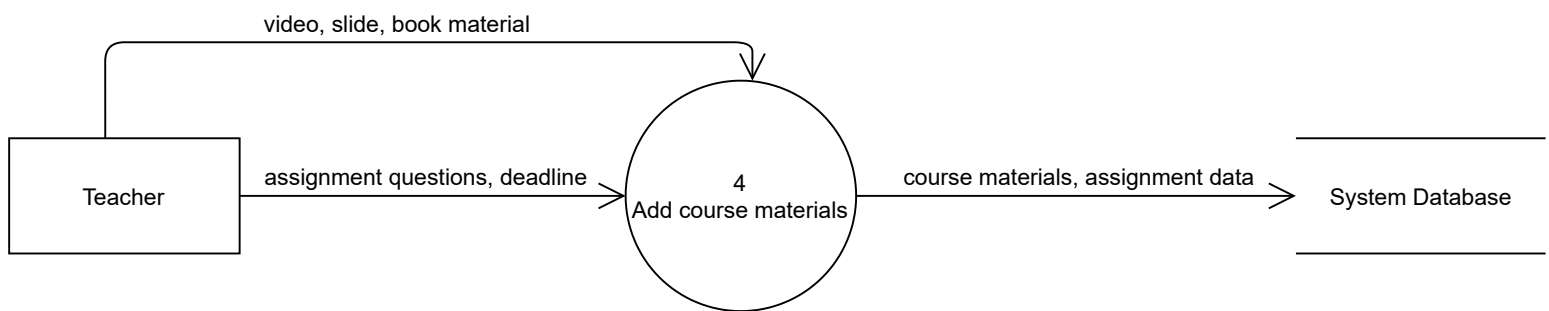
Level 1 diagram of See Course Material process



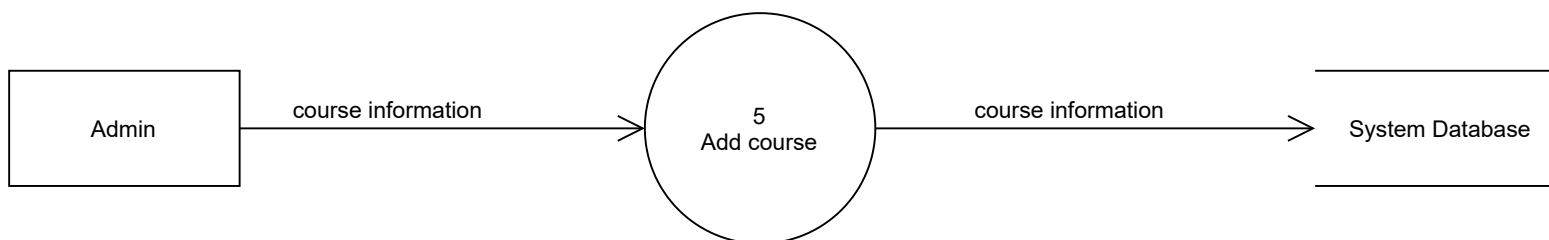
Level 1 diagram of Add Exam process



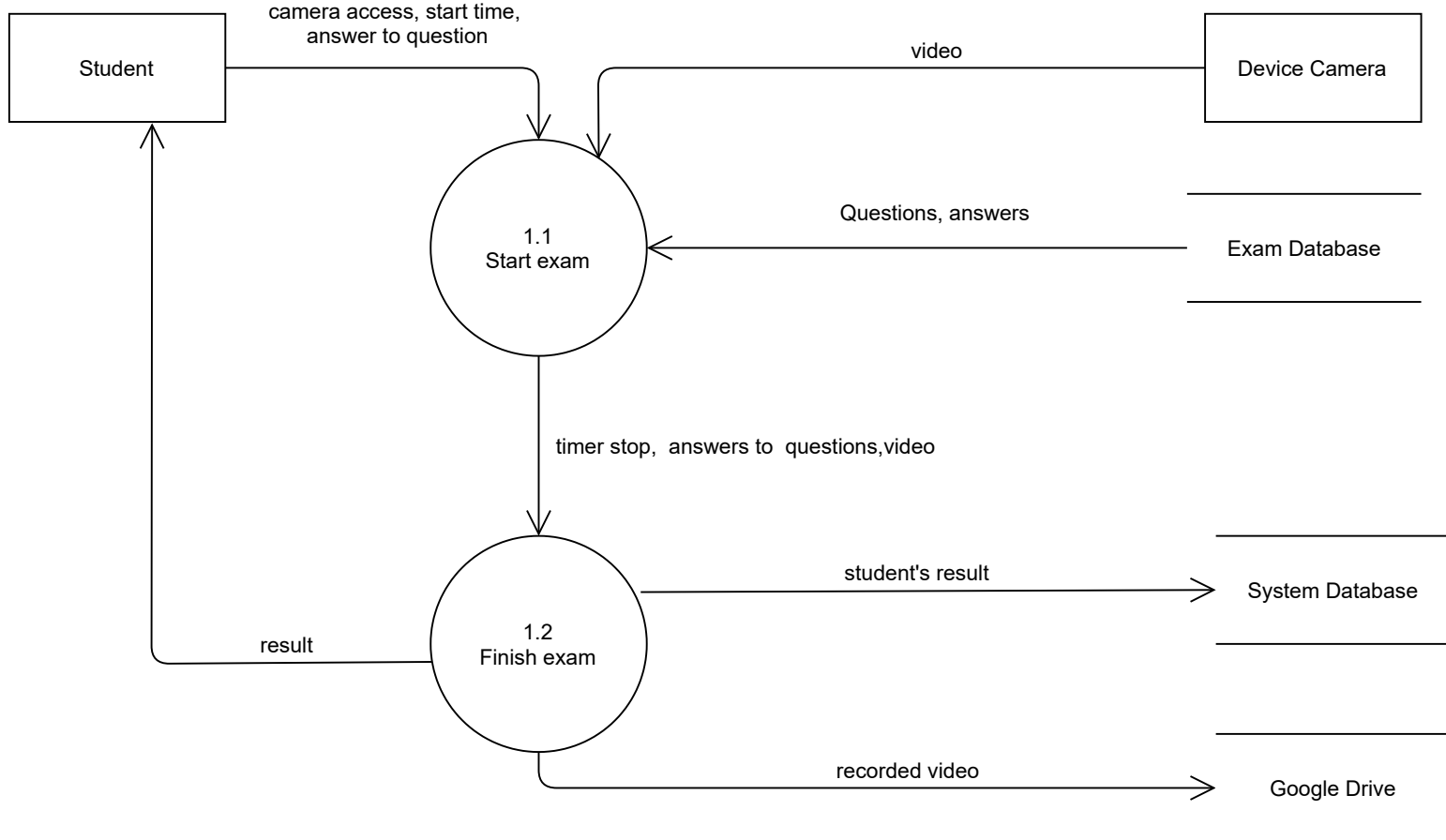
Level 1 diagram of Add Course Materials process



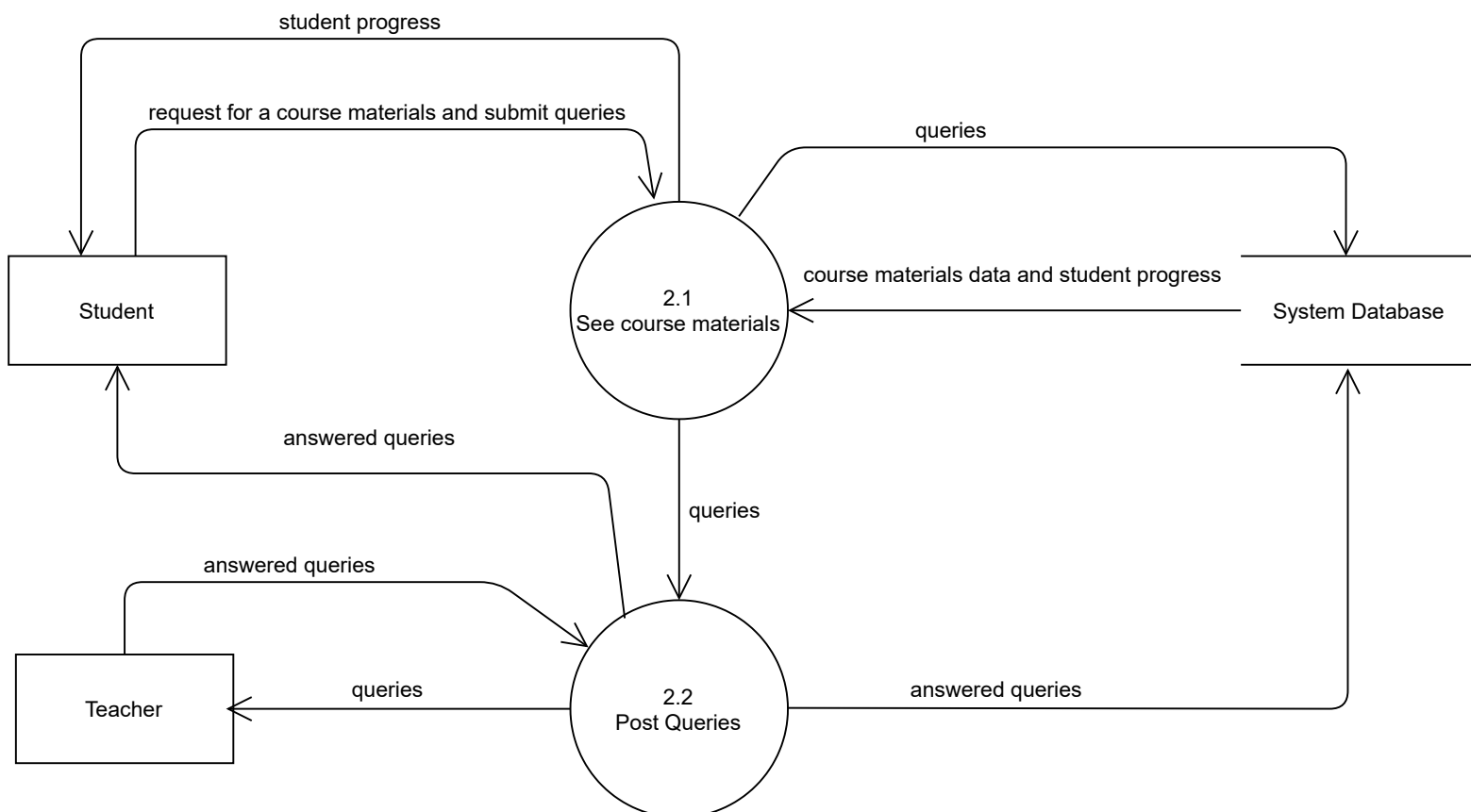
Level 1 diagram of Add Course process



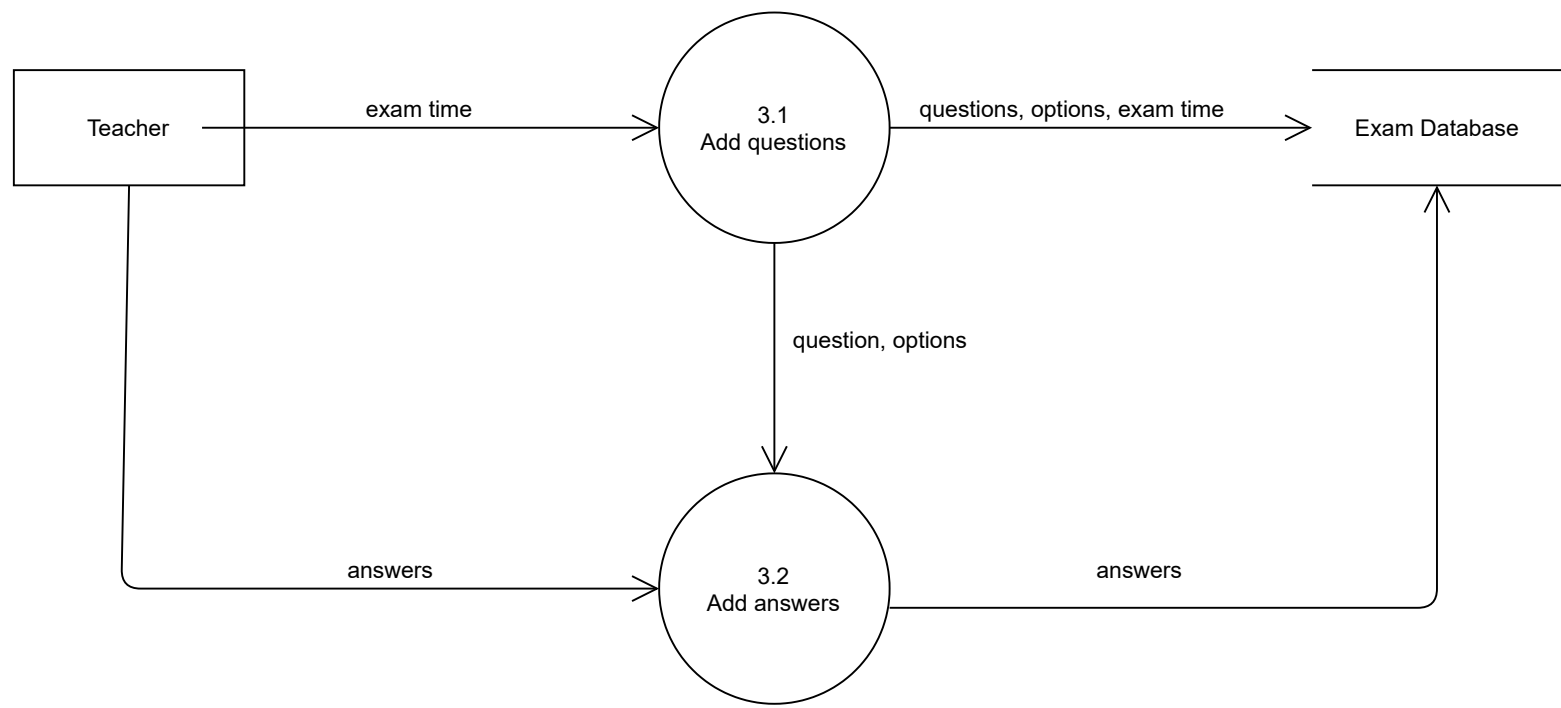
Level 2 diagram of Attend Exam process



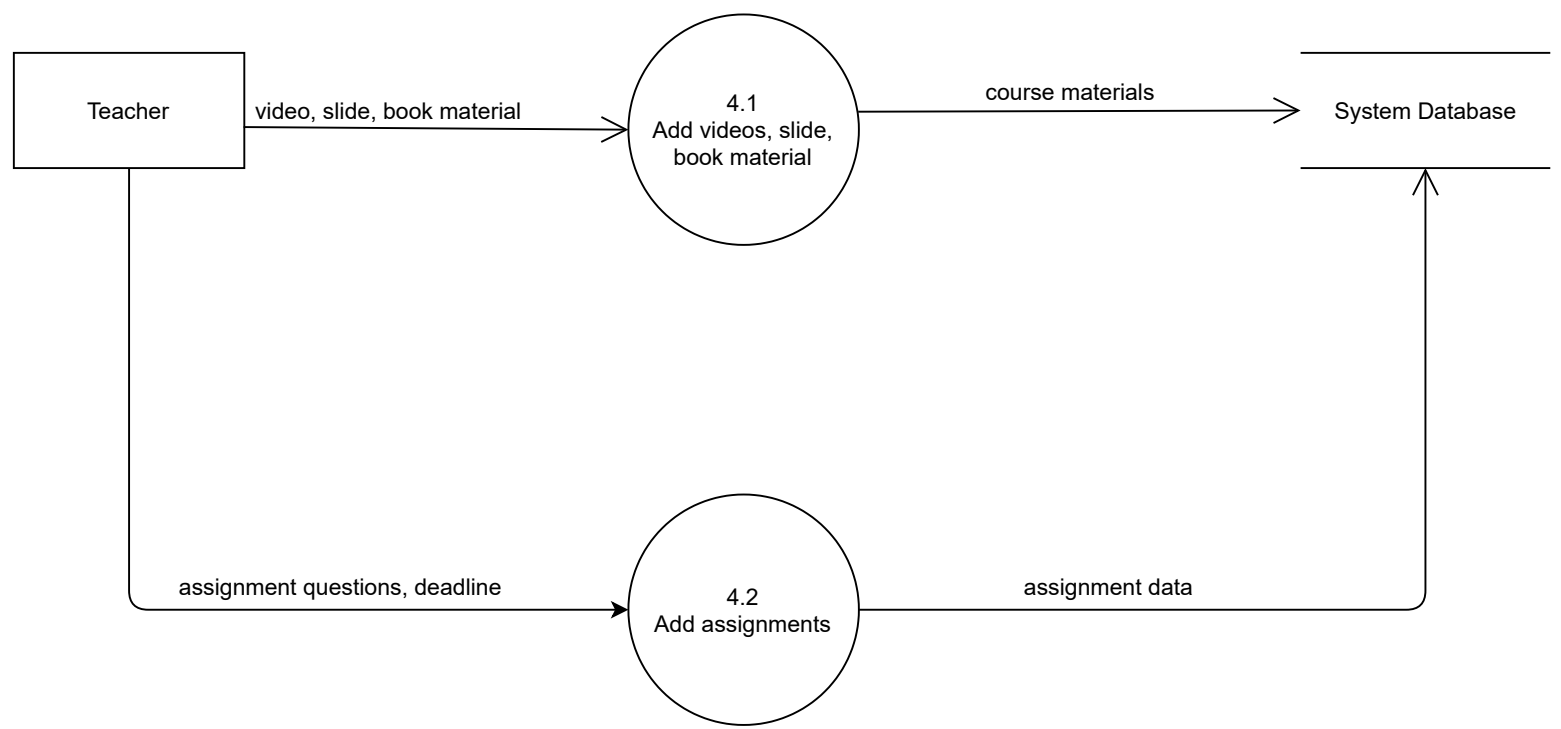
Level 2 diagram of See Course Material process



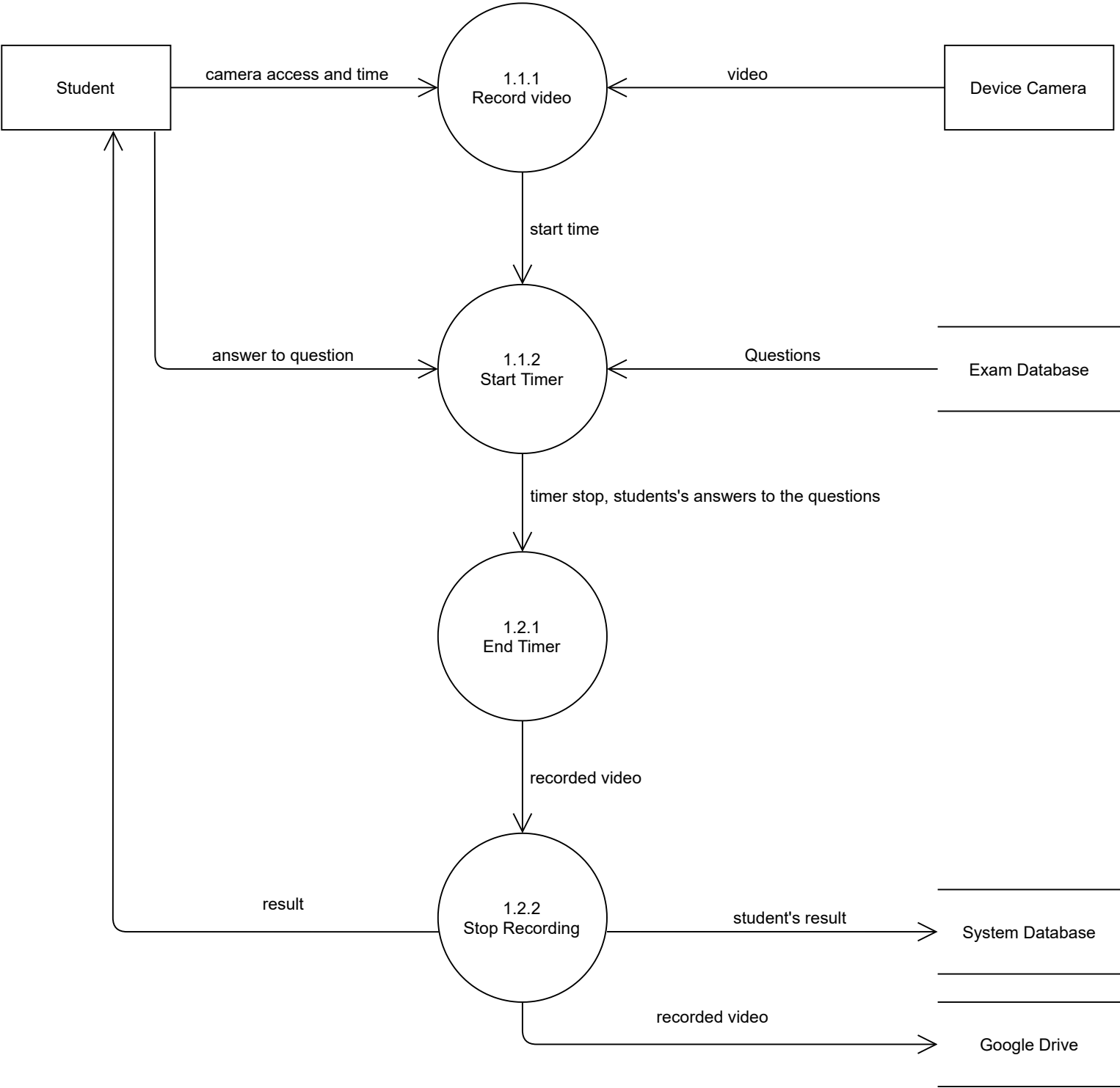
Level 2 diagram of Add Exam process



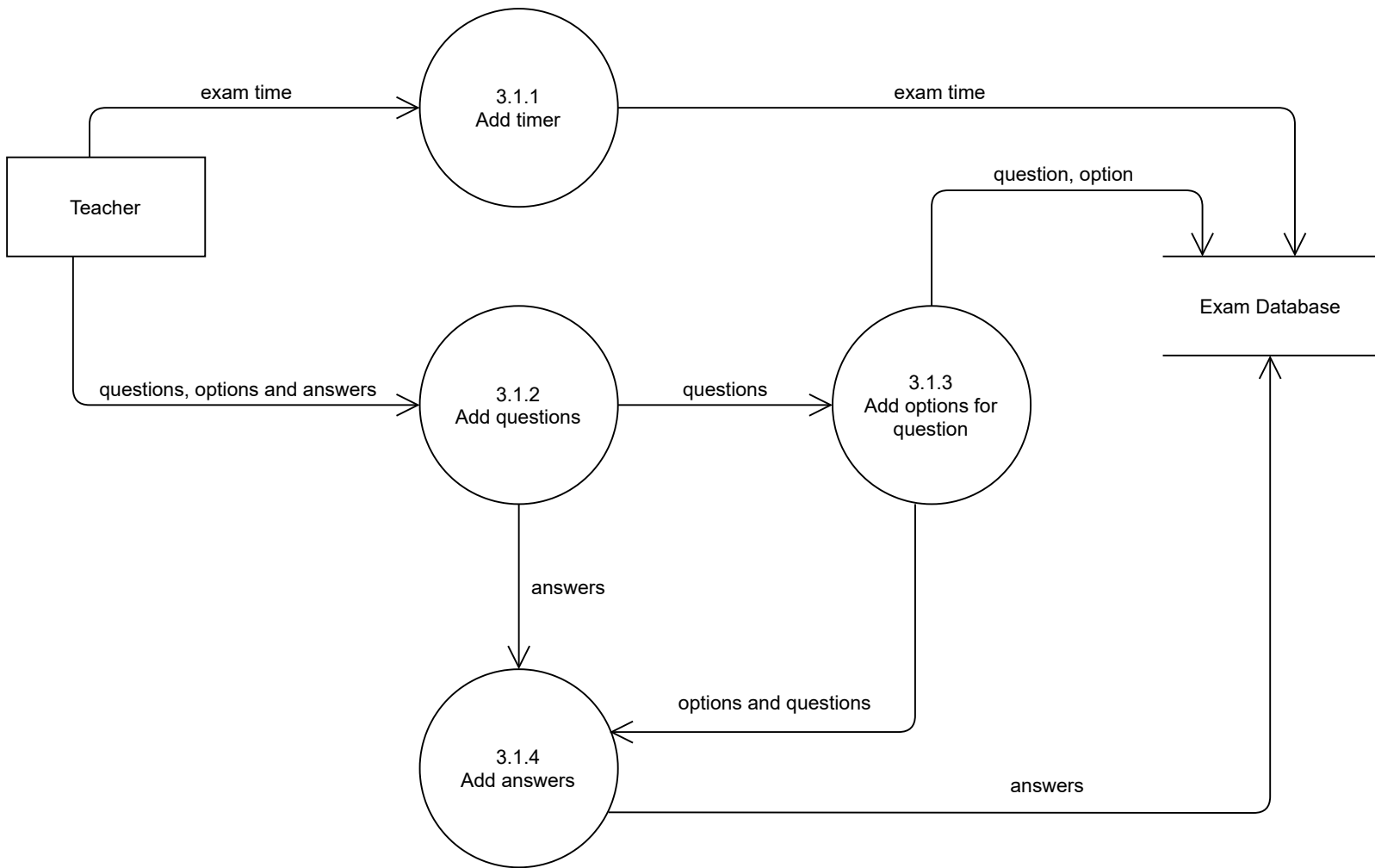
Level 2 diagram of Add Course Material process



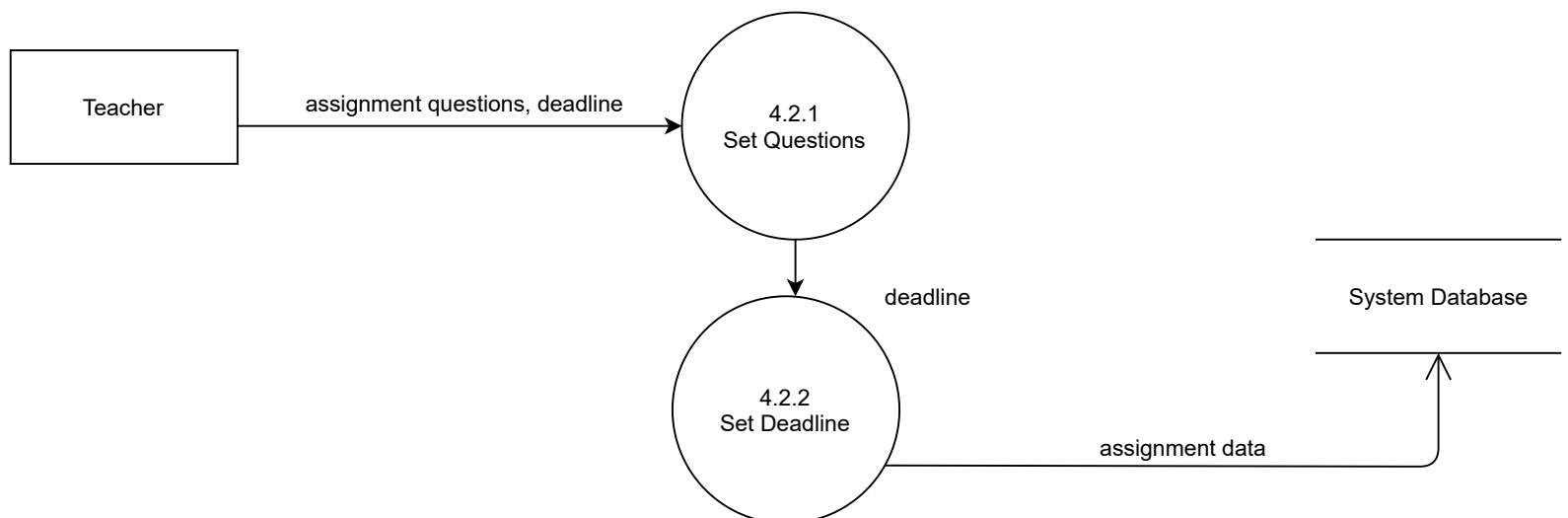
Level 3 diagram of Attend Exam process



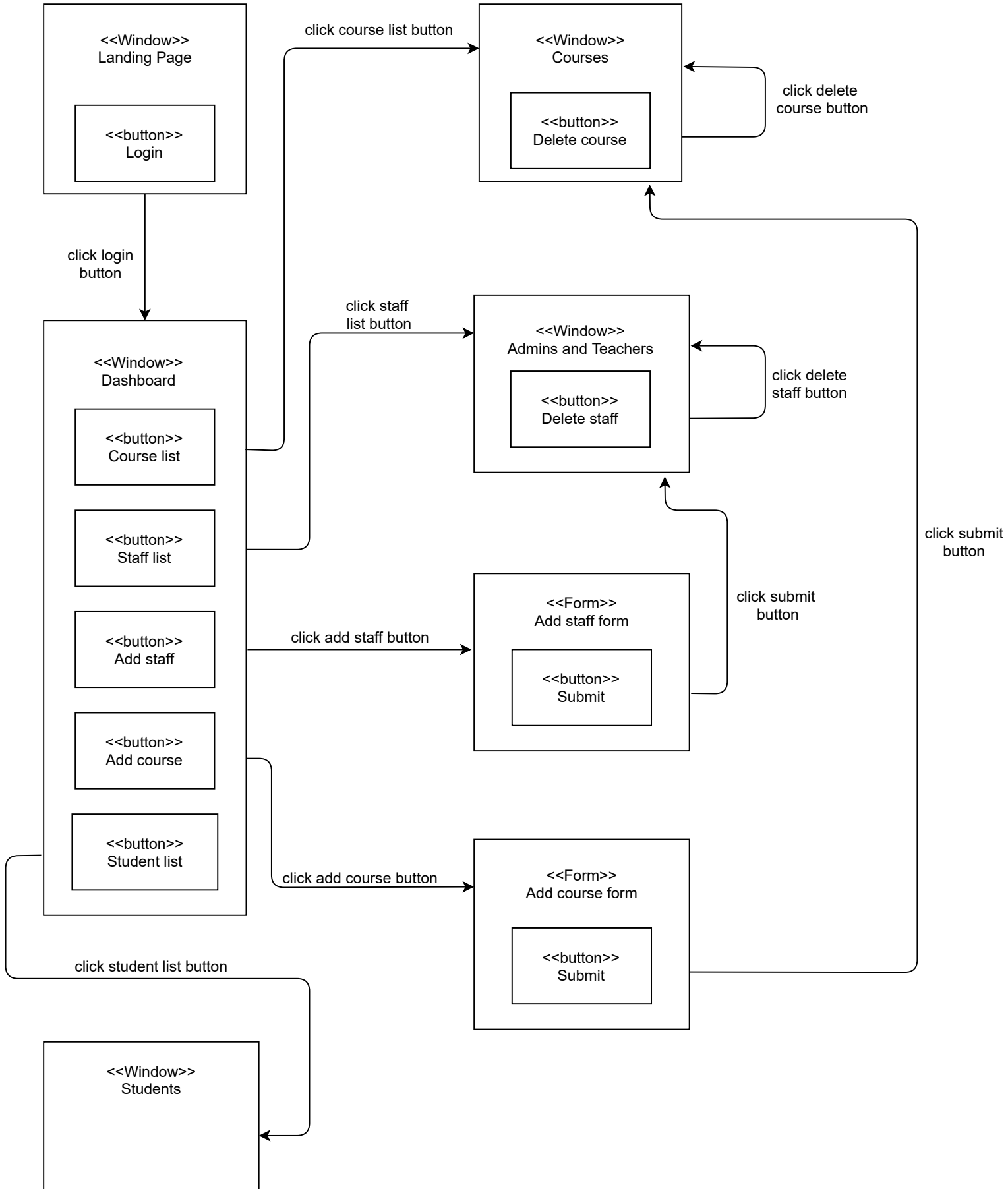
Level 3 diagram of Add Exam process



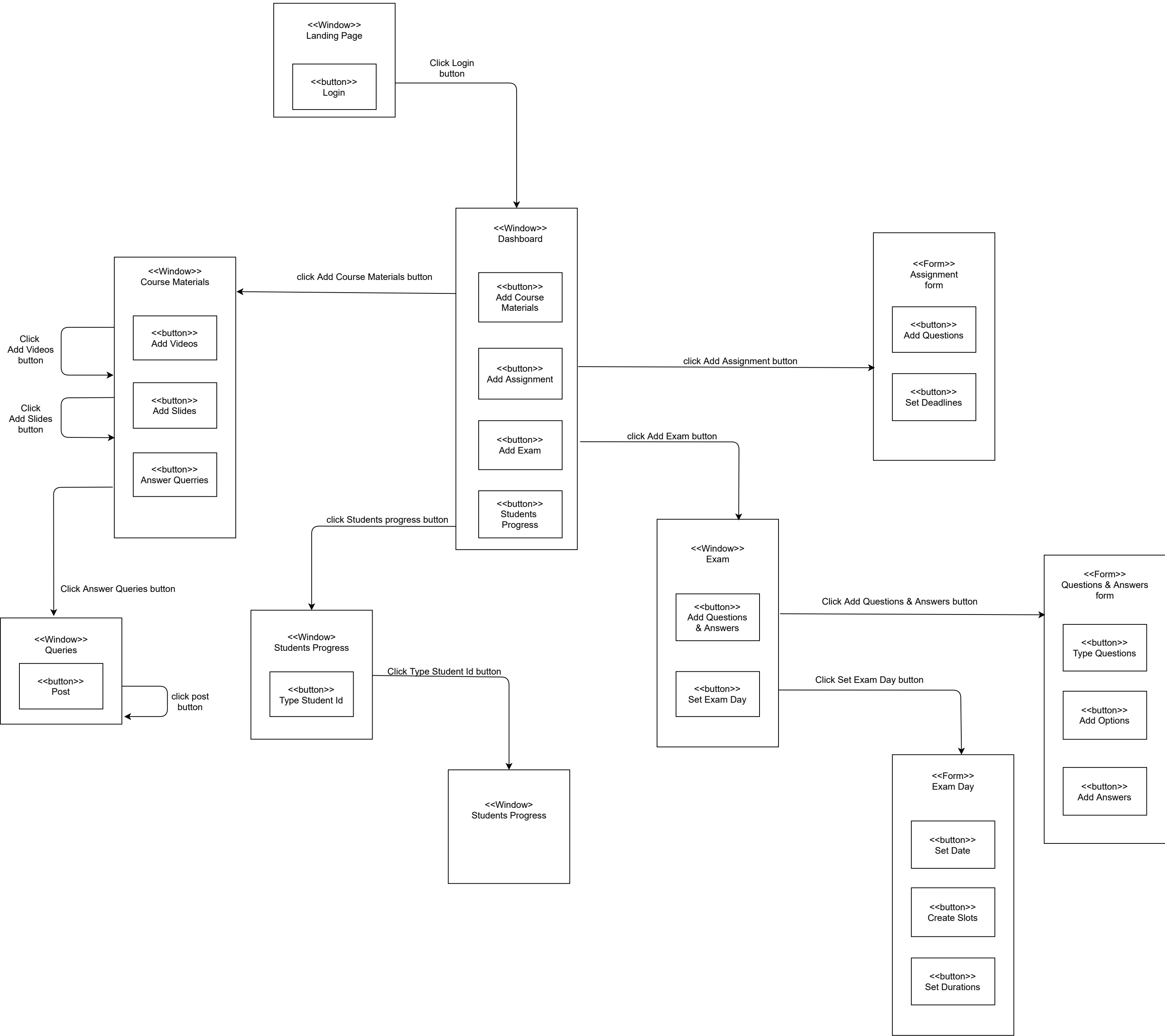
Level 3 diagram of Add Course Material process



Windows navigation diagram for Admin UI



Windows navigation diagram for Teacher UI



Windows navigation diagram for Student UI

