Software Engineering Laboratory Project
Teaching Service System

The Teaching Service System is based on the university network to provide service for the teaching activities. The system is composed of 7 subsystems: information management, automatic course arrangement, course selection, course resource share, discussion forum, online testing, and score management.

1. Information Management Subsystem

The subsystem is responsible for user information, privilege and course information, and can provide security assurance for all system. Users of the system include students, teachers, managers and system administrators.

- User information management: managers can add, edit and delete students and teachers, can search and browse student or teacher's information, and can set the user type and rights. All users can manage personal information, fill in or modify the information, upload photos and so on.
- Course basic information management, including course name, course credits, course capacity, course assessment and other basic information of the course.
- User rights management: the user rights management is mainly reflected in other subsystems. Different types of user have different types of permissions. The system should ensure that unauthorized users can't overstep his authorities.
- System security management: responsible for the whole system's security, including the security of users' information and password, intrusion prevention management, system log records and so on.

2. Automatic Course Arrangement Subsystem

The subsystem can automatically arrange the course to reasonably utilize the schools' teaching resources according to the classroom information, course information, teacher information and other factors. The course arrangement can be adjusted by hand.

- Teaching resource management: Add or modify the basic information of every classroom, such as which campus it belongs to, classroom capacity.
- Automatically course scheduling: Based on the course information, classroom information and other comprehensive factors, the system automatically arranges the course. And the course time can't be conflicted with the classroom and teacher information. The course distribution should consistent with a uniform or with common sense.
- Manually course adjustment: According to the teacher's request or classroom resource requirements, the course arrangement can be manually adjusted without conflict.
- Schedule Inquiry: After the course arrangement is completed, teachers can query and print his class schedule. And can search every classroom's class schedule.
- Performance indicators or other constraints: The course scheduling results should consider all kinds of factors as far as possible. To fully utilize the teaching resources and facilitate students and teachers.

3. Course Selection Subsystem

The subsystem is based on certain constraints (such as course capacity, student major cultivation program) and allowed students to select the course at his own interests. The selection includes first-round selection and by-election function.

- Major cultivation program: Different students have different major cultivation programs, before course selection, every student should formulate their major cultivation program.
- Course information search and browse: students can search all kinds of course information according course name, teacher name or course id. The system will return the course details.
- Course selection: According to students' major cultivation program and the course capacity, students can select the course with his interests.
- Result view: after the course selection, students can view and print their curriculum. Teachers can get the course selection result such as the student list, the course time.
- Course selection management: take the number of students into consideration, the system must control the number of students online, and control time about when the first-round selection starts and when the by-election starts. The administrators can manually select some course for some special students.
- Performance indicators or other constraints: the subsystem should allow at least 200 students to select course concurrently, and for the students who have login the system without any operation for a long time, the system should force them offline.

4. Course Resource Sharing Subsystem

The subsystem is mainly responsible for sharing and utilization of course resource between teachers and students and for students to upload their homework or laboratory reports.

- Resource sharing: Teachers and students can upload any resources associated with the course such courseware, exercise materials. They can also download any resource from the system.
- Homework assignment and submission: Teachers can publish the homework information and set a deadline for homework. Students should upload their homework or laboratory reports before the deadline.
- Resource management: with the growth of course resource, the administrator should manage a large amount of resource. For example, the administrator can put the resources that have been downloads by most users in a visible place.
- Resource retrieval: provide a search model for the users to retrieval resource.

5. Discussion Forum Subsystem

The course forum subsystem is to promote the communication between teachers and students, students and students.

- Forum announcement: teachers can issue a course related notification or other information.
- Post Publish: teachers and students can publish posts to discuss questions associated with the course, and the post can attach some related files.
- Post comment: User can reply any posts to give his opinion about the questions. And users can communicate with each other online.
- Forum management: The forum administrator can analyze the most viewed posts or the posts that have replied by most user in a week or a month.
- Post retrieval: provide a search model for the users to retrieval posts.

6. Online Testing Subsystem

The subsystem is mainly for teachers to generate question bank and for students to take online exam.

- Question bank management: Teachers can add, delete, modify or query the question bank

which including choice question and judgment question. In the question bank, every question is composed of question and answer.

- Paper generation: Teachers can generate a paper from the question bank by hand. Test papers can also automatically generate within a limited range.
- Students online Test: After the paper is generated, students can take online testing in a limited time. The test score will come out as soon as student submits his answer.
- Score statistic analysis: Teachers can use the system's statistic analysis function to analyze the scores such as which questions are error-prone. And students can view their historical performance.
- Performance indicators or other constraints: The online testing subsystem should allow at least 100 students to take online test concurrently.

7. Score Management Subsystem

The subsystem is mainly for teachers to record student achievement and for students to query their scores, and has some statistic analysis functions about the scores.

- Score record: after the course exam, teachers can input all students' score, and before formal submission, the teacher can modify and query any scores. After submission, if the teacher wants to modify any score, he must submit an application form to explain the reason.
- Score query: if teachers have submit the course score, students can query his scores, and can get his score's statistic analysis.
- Score analysis: this function is mainly for teachers to analyze a course's score distribution, including the average score, score distribution, score ranking statistic. And the result should show in some form of chart for them to understand better. At the same time the system can show students' individual achievement in a statistical analysis form including GPA, average scores, total credits and so on.