Marmara University Engineering Faculty

Department of Computer Engineering

CSE3063 - OBJECT ORIENTED SOFTWARE DESIGN

PYTHON ITERATION

REQUIREMENTS ANALYSIS DOCUMENT (RAD)

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Introduction

The aim of the project is to allow students to submit their course selection to their academic advisor for approval. In order to do this, the project considers various factors, including:

- the grade point average that the students have achieved up to the current semester
- the courses that the students have passed or failed
- the prerequisites for courses that the students have failed
- the number of credits that the students have completed The goal is to ensure that students can choose courses that are appropriate for their academic standing and that they are able to take the necessary prerequisites in order to succeed in their chosen courses.

Problem description

In our project aim is a simulating course registration system for computer engineering students at Marmara University. The system will include information about students, advisors, and the semester in which the students are enrolled (e.g., freshman, senior). It will also include information about the courses that the students are taking and the semester in which they are taking them (e.g., fall or spring). The project is intended to simulate a structure with students, lecturers, advisors, and multiple classes. This means that the course registration system will be designed to mimik the way that courses are typically organized and registered at a university, with students choosing courses and advisors approving their selections. It may also include other features or functions that are commonly found in university course registration systems, such as the ability to track course credits or prerequisites.

A simulated structure in which students and advisors are randomly assigned to each other. Once the students and advisors have been randomly created, each student will be paired with a random advisor. This is because, in the simulated system, the students are required to send their course selections to their advisors for approval. The advisors are

responsible for reviewing the students' course selections to ensure that they meet certain criteria. This includes ensuring that the students have satisfied any prerequisites for the courses they are choosing, ensuring that the courses do not overlap in terms of scheduling, and ensuring that the courses fit within the students' overall curriculum. The advisors must also approve the credits for the courses that the students are taking. In the simulated system, the courses that the students are eligible to take should be made available to them, while any courses that have prerequisites that have not been satisfied should not be available.

Process for selecting courses in a course registration system. According to the rules outlined in the sentence, if a course that a student took or failed in a previous semester is offered again in a subsequent semester, the student must take that course before they can select any other courses. If the student meets the credit requirements for the semester, they are then able to choose their courses for that semester. Once the student has made their course selections, they are required to send them to their advisor for approval. The advisor reviews the courses that the student has selected and either approves or rejects them. The rules outlined in this sentence are intended to ensure that students are able to complete their coursework in an orderly and efficient manner, and that they are not able to take courses for which they are not prepared.

Process by which an advisor reviews and approves or rejects a student's course selections. The advisor's approval is subject to certain conditions, which are listed in the sentences that follow. These conditions include:

- The selected course must have space available in the section that the student wants to enroll in.
- If the selected course has a prerequisite, the student must have passed that prerequisite course.
- If the selected course has a credit requirement, the student must have completed that requirement.
- The student's courses must not overlap in terms of scheduling, meaning that two courses cannot meet at the same time for more than one hour.
- The student's courses must be included in their curriculum.

If any of these conditions are not met, the advisor will reject the student's course selections. If one of the rejected courses is a technical elective, the student may be able to enroll in another technical elective that is offered in that semester and has space available. If the rejected course is not a technical elective, the student must wait until the course is offered again in a future semester. After the course registration process is completed, the student's approved courses will be recorded on their transcript and listed on the "courses taken" tab.

Fully Dressed Use Case

In this scenario, there are several actors involved in the course registration process:

1. Student: The individual who is seeking to enroll in courses.
2. Advisor: A person who provides guidance and support to the student during the registration process.
3. Registration System: A computer system or software application that is used to manage the process of enrolling in courses.
4. Course: A specific academic program of study or subject area.

The process described in the sentences involves the following steps:

1. Determining which grade the student is in, the period in which she will be registered, and the list of courses she has already completed.
2. Appointing an advisor to assist the student with the registration process.
3. Adding any failed courses to the system.
4. Presenting the student with their transcript before enrolling.
5. Listing the compulsory courses that the student must enroll in and the compulsory courses for the current semester.
6. Allowing the student to choose from the courses on the list presented.
7. Requiring the student to send their list of chosen courses to their advisor for approval.
8. Checking for conflicts and verifying that the courses are credited and conditional.
9. If the student's course eligibility is approved, sending the course request and, if the quota is not full, successfully registering the student.
10. Requiring the student to register for required courses in the drop-down list.
11. Allowing students to successfully or unsuccessfully register themselves for the courses offered by the registration system.

In the main flow of the course registration process described earlier, there are several alternative flows that can occur if certain conditions are met. These alternative flows are described in the sentences you provided as follows:

Alternative Flow: If there is an overlap in classes for more than an hour and it is mandatory to take that class

8a. There is no alternative for the courses that students are required to take during the semester if they cannot register for that course. 8b. If the student does not take a course, they must follow the other courses in the curriculum.

Alternative Flow: If there is more than one conflict in elective courses 8c. If more than one course overlaps in technical elective courses, the student can choose from other elective courses offered to them.

8d. The student sends their choice of elective course to their advisor for approval.

Alternative Flow: If the course to be taken by the student is full and the course is compulsory for the student

9a. Since the course that the student must choose is a compulsory department course, there is no option to choose another course. 9b. If the student cannot take the compulsory course, they should choose other compulsory courses.

Alternative Flow: If the student cannot complete the credit and prerequisite requirement and this course is compulsory for them

9c. If the student cannot meet the credit and prerequisite conditions, they cannot take the course because the compulsory course does not have an option like elective courses.

9d. The student must move on to the next lesson in the courses offered.

Alternative Flow: If the student cannot meet the prerequisite and the course to be taken is technical elective

9f. If the student cannot meet the prerequisite, they cannot take the technical elective course.

9g. The student creates a list of courses for which they have the prerequisite and sends it to the advisor for approval.

9h. The advisor approves the student's course request from the registration system.

Functional Requirements

Functional requirements are specific behaviors or functions that a system is expected to perform. They describe what the system should do, rather than how it should do it. In this set of sentences, the functional requirements for a project are divided into three main categories: priority, criticality, and risks. The specific functional requirements for the project are then listed. These requirements include:

- The system must provide enrolled courses for students.
- The system must provide transcripts for students.
- The system must provide courses that students need to register for.
- The system must adjust the relationship between courses, prerequisites, semester requirements, and credit requirements for registration.

- The system should show students which courses they have previously taken, which courses they need to repeat, and which courses are newly available to them.
- The system should facilitate the process of students sending their course selections to their advisors and advisors reviewing those selections.
- If a student is unable to take a course, there must be a reason for this, such as a full course quota, a missing prerequisite, or a conflict with the student's curriculum.

These requirements specify the key behaviors and functions that the system must perform in order to meet the needs of the users.

Non-Functional Requirements

Non-functional requirements are a set of criteria that a customer wants the project and its developers to meet while using the project after delivery. These criteria may include:

1. Availability: The system should be available for use at all times, or if downtime is inevitable, it should be minimized as much as possible.
2. Maintainability: The code of the system should be designed in such a way that it is easy to modify or update over time.
3. Performance: The system should be efficient in terms of response and startup times, and should be able to handle a high volume of requests without slowing down.
4. Safety: The system should not pose any risks to the environment or to people using it.
5. Security: The system should be secure, with appropriate measures in place to prevent unauthorized access or intrusion.

Glossary

Registration: The process of enrolling in courses for a particular semester or academic term.

Credit: A unit of measurement used to indicate the amount of coursework or training required to complete a program.

Curriculum: The set of courses and academic material that make up a program of study at a school.

Transcript: A document that lists a student's academic history, including the courses they have taken, the grades they received, and any degrees or awards they have earned.

Prerequisite: A course or requirement that must be completed before a student can enroll in a particular course.

Semester: A term of study at a school, typically lasting around half a year.

Quota: A limit on the number of students who can enroll in a course or program.

Lab: A laboratory, where students can conduct practical experiments or hands-on learning activities as part of a course.

Session: A specific time slot or period of time during which a course is offered. Some courses may have multiple sessions available, allowing students to choose the one that best fits their schedule.

GPA (Grade Point Average): A measure of a student's academic performance, calculated by averaging the grades they have received in all of their courses over a specific period of time (such as a semester or academic year). The GPA is typically calculated on a scale of 1.0 to 4.0, with 4.0 being the highest possible score.

Department: A division or unit within an organization, typically responsible for a specific area of work or study. In the context of education, departments are often associated with particular academic disciplines or subject areas, and may be responsible for offering courses and degree programs within that field of study.

Domain Class Diagram