

SER415 Software Enterprise: Inception & Elaboration

Assignment: Use Case Development

Below is a narrative describing a Course Registration system:

“As the head of information systems for Haley College you are tasked with developing a new student registration system. The college would like a new client-server system to replace its much older system developed around mainframe technology. The new system will allow students to register for courses and view report cards from personal computers attached to the campus LAN. Professors will be able to access the system to sign up to teach courses as well as record grades.

At the beginning of each semester, students may request a course catalogue containing a list of course offerings for the semester. Information about each course, such as professor, department, and prerequisites, will be included to help students make informed decisions.

The new system will allow students to select four course offerings for the coming semester. In addition, each student will indicate two alternative choices in case the student cannot be assigned to a primary selection. Course offerings will have a maximum of ten students and a minimum of three students. A course offering with fewer than three students will be canceled. For each semester, there is a period of time that students can change their schedule. Students must be able to access the system during this time to add or drop courses. Once the registration process is completed for a student, the registration system sends information to the billing system so the student can be billed for the semester. If a course fills up during the actual registration process, the student must be notified of the change before submitting the schedule for processing.

Professors must be able to access the on-line system to indicate which courses they will be teaching. They will also need to see which students signed up for their course offerings. In addition, the professors will be able to record the grades for the students in each class.”

Based on this narrative, perform the following activities:

1. Perform step 1 of the use case “How to do it” process in your notes: “Identify and describe Actors”
2. Perform steps 2 & 3: create the use case catalog and the “bubble” (use case) diagram. For each use case you should identify a title, objective, and description (feel free to cut and paste from the above text)
3. For your top 2 use cases, perform step 4: “Outline the Individual Use Cases”. The “top” use cases are those you would consider to represent the essence of the system. Write the Happy Day scenario.
4. Select 1 of the use cases from the previous step and write a complete, detailed use case (step 5).
5. Revisit the above narrative – are there functional or nonfunctional requirements that do not easily fit in the use case model? Identify these candidates for the supplementary specification.

USE CASE STEP-BY-STEP PROCESS WORKSHEET

Step 1: Identify Actors

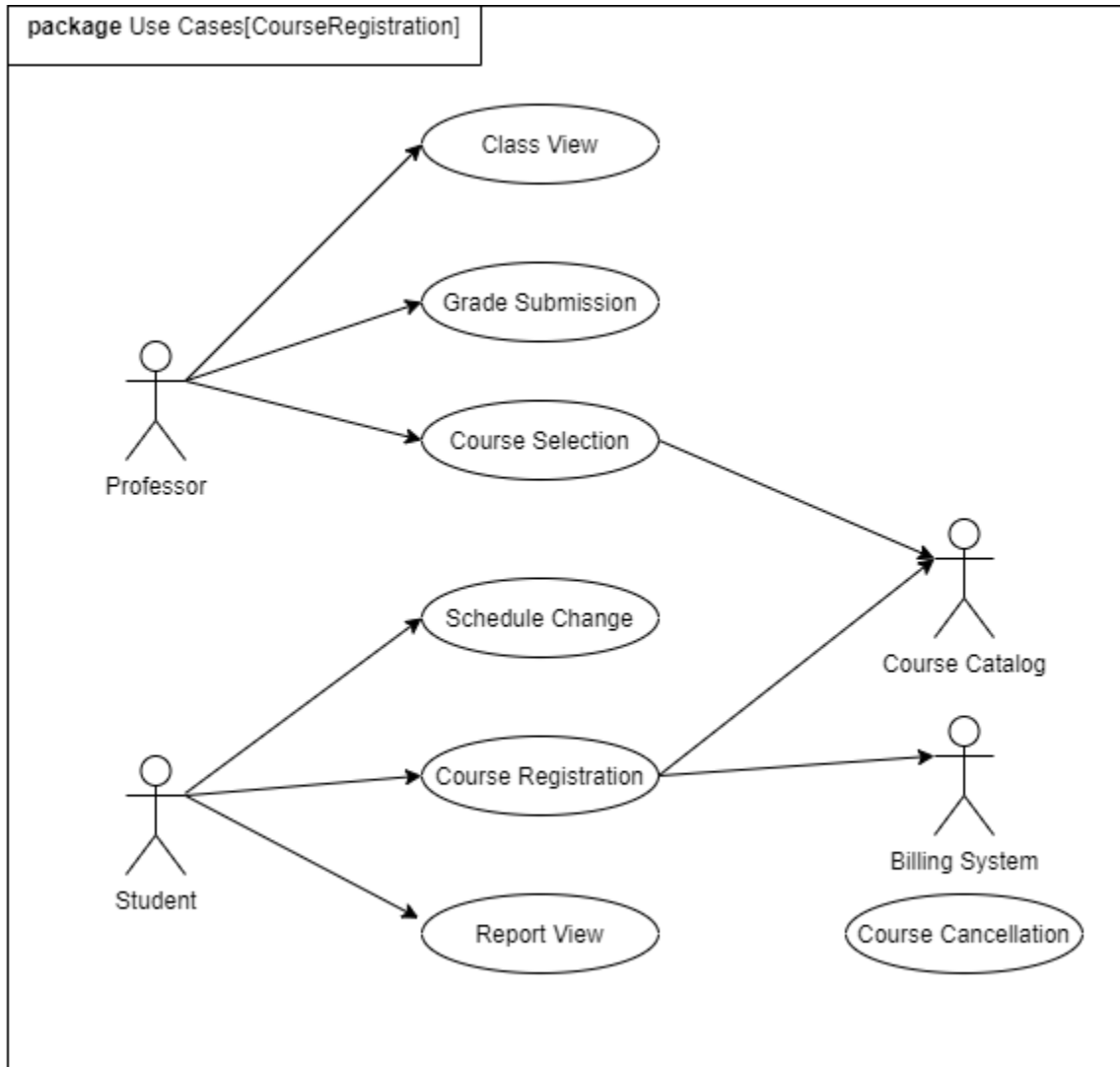
1. Student – The student is one of the primary actors of the system since students have clear needs, like viewing report cards, etc.
2. Professor – The professor is one of the primary actors of the system since professors have clear needs, like assigning themselves to courses, etc.
3. Course Catalog – Examining the language of the requirements closely, it appears that another entity is responsible for handling the catalog. This entity can be identified as a user since it needs to contain descriptions of courses in the system.
4. Billing System – The billing system acts as a secondary actor in the system since it facilitates the interaction from the student in registering.

Step 2: Identify Use Cases – Create the Use Case Catalog

Use Case Name	Short Description (Goal Statement, Primary Actor, Trigger)
UC-GS-1 Grade Submission	“ <u>Professors</u> will be able to record the grades for the students in each class.”
UC-CC-1 Course Cancellation	“A course offering with fewer than three students will be cancelled”
UC-CR-1 Course Registration	“The new system will allow <u>students</u> to register for courses”
UC-SC-1 Schedule Change	“ <u>Students</u> must be able to access the system during this time to add or drop courses”
UC-CS-1 Course Selection	“ <u>Professors</u> must be able to access the on-line system to indicate which courses they will be teaching.”
UC-RV-1 Report View	“The new system will allow <u>students</u> to ... view report cards”
UC-CV-1 Class View	“ <u>Professors</u> will also need to see which students signed up for their class offerings”

Step 3: Identify Actor to Use Case relationships

Do this by drawing a use case diagram on this page. Only (and all) actors from your list of actors in Step 1 should be in the diagram, and only (and all) use cases from Step 2 should be included as well. Create the model in Astah and copy here.



Step 4: Outline the Individual Use Cases

Use the Use Case Template provided for your project

USE CASE: UC-CC-1 Course Cancellation

Objective: Course must be cancelled

Primary Actor (PA): N/A

Trigger: Course has fewer than 3 students by end of registration period

Preconditions: Registration period ends

Post Condition(s): N/A

MAIN SUCCESS SCENARIO

1. Course has fewer than 3 students by end of registration period
 2. Course is cancelled
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USE CASE: UC-SC-1 Schedule Change

Objective: PA needs to add or drop courses

Primary Actor (PA): Student

Trigger: PA selects add or drop course options

Preconditions: Student has already registered for at least one course

Post Condition(s): PA billing is adjusted

MAIN SUCCESS SCENARIO

1. PA selects add or drop course options
 - a. If adding a course, PA selects course that has no more than 10 students registered for upcoming semester
 2. System accepts selections and sends information to Billing System
 3. System adjusts PA billing depending on adding or dropping options
-

USE CASE: UC-CS-1 Course Selection

Objective: PA needs to select course to teach

Primary Actor (PA): Professor

Trigger: PA requests course catalog

Preconditions: Course offering has at least 3 students registered

Post Condition(s): N/A

MAIN SUCCESS SCENARIO

1. PA requests a course catalog
 2. PA selects course for upcoming semester
 3. System notifies PA that they are registered
-

USE CASE: UC-CR-1 Course Registration

Objective: PA needs to register for courses

Primary Actor (PA): Student

Trigger: PA requests a course catalog

Preconditions: Course offering has no more than 10 students registered

Post Condition(s): PA is billed for registration

MAIN SUCCESS SCENARIO

1. PA requests a course catalog
 2. PA selects courses for upcoming semester
 3. System accepts selections and sends information to Billing System
 4. System bills student for registration
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USE CASE: UC-RV-1 Report View

Objective: PA needs to view their own report card

Primary Actor (PA): Student

Trigger: PA requests to view their own report card

Preconditions: It is currently the end of the semester.

Post Condition(s): N/A

MAIN SUCCESS SCENARIO

1. PA requests to view their own report card
 2. PA views their own report card.
-

USE CASE: UC-CV-1 Class View

Objective: PA needs to view class roster

Primary Actor (PA): Professor

Trigger: PA requests to view class roster

Preconditions: PA is assigned to class whose roster they need to view

Post Condition(s): N/A

MAIN SUCCESS SCENARIO

1. PA requests to view class roster
 2. PA views class roster
-

USE CASE: UC-GS-1 Grade Submission

Objective: PA will be able to record the grades for students in each class

Primary Actor (PA): Professor

Trigger: PA requests ability to record grades

Preconditions: N/A

Post Condition(s): N/A

MAIN SUCCESS SCENARIO

1. PA accesses system
2. PA records grades

Step 5: Refine the Use Cases

Pick a Use Case from Step 4, write the Alternate Scenarios and Failure Variations, plus Biz Rules and Notes. There may be more than one variation or failure scenario. Again see the Use Case Template for your project.

Use Case selected (from previous page): UC-CR-1 Course Registration

Variations

Variation ID: UC-CR-Var-1: Alternative Course Selection

Preconditions: System cannot assign student to primary course selection

Variation Scenario:

After Step 2, Main Success Scenario: PA selects two alternative courses

Modify Step 3, Main Success Scenario: System fails to assign primary selections, so alternative choices are substituted

Failure Variations

Variation ID: UC-CR-Var-F-1: No more course seats

Preconditions: During registration period, the selected course becomes full

Postconditions: PA is not registered for selected course

Failure Variation Scenario:

After Step 2, Main Success Scenario: Course reaches maximum limit as PA simultaneously registers.

Alternate Step 3, 4: PA is prevented from registering and is notified by system.

Business rules

1. Courses can have up to 10 students, but no fewer than 3
2. There exists a registration time frame where students can make add and drop modifications to class enrollments.
3. Registration can happen only on computers associated with campus LAN.

Notes:

1. Course information should include professor, department, and prerequisites.
2. If professor is not yet assigned to course, it should show "Staff"
3. While registration period is not clearly defined, it is likely that a system component will be responsible for automatically deleting courses if registration threshold is not met.