

Object Oriented Analysis and Design

CASE Study 3

Eastern State University (ESU)

Background

The process of assigning Professors to courses and the registration of students is a frustration and time consuming experience.

After the Professors of ESU have decided which courses they are going to teach for the semester, the Registrar's office enters the information into a computer system. A batch report is printed for Professors indicating which courses they will teach. A course catalog is printed and distributed to the students.

Currently, the students fill out registration forms that indicate their choice in courses, and return the completed forms to the Registrar's office. The typical student load is four courses. The staff of the Registrar's office then enters the students' forms into the computer. Once the students' curriculum for the semester has been entered, a batch job is run overnight to assign students to courses. Most of the time student's get their first choice; however, in those cases where there is a conflict, the Registrar's office talks with each student to get additional choices. Once all students have been successfully assigned to courses, a hard copy of the students' curriculum is send to the student's for their verification. Most student registrations are processed within a week, but some exceptional cases take up to two weeks to solve.

ESU Course Registration

Problem Statements

At the beginning of each semester, students may request a course catalog containing a list of course offerings for the coming semester. In addition, each student will indicate two alternative choices in case a course offerings become filled or cancelled. No course offering will have more than ten students or fewer than three students. A course offering with fewer than three students will be canceled. Once the registration process is completed for a student, the registration system sends information to the billing system so that student can be billed for the semester.

Professors must be able to access the online system to indicate which courses they will be teaching, and to see which students signed up for their course offerings.

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.

Case Study on ESU Course Registration Solution

Actors in the ESU Course Registration System

The following findings will help you to identify the actors.

- Student want to register for courses
- Professors want to select courses to teach.
- The Registrar must create the curriculum and generate a catalog for the semester.
- The Registrar must maintain all the information about courses, Professors and Students.
- The Billing system must receive billing information from the system

Based on the above statements, the following **Actors** can be identified.

Student, Professor, Registrar, and the Billing System

Use Cases in the ESU Course Registration System

The following findings will help you to identify the Use Cases.

- The student actor needs to use the system to registrar for courses
- After the course selection process is completed, the Billing System must be supplied with billing information
- The Professor actor needs to use the system to select the courses to teach for a semester, and must be able to receive a course roster from the system.
- The Registrar is responsible for the generation of the course catalog for a semester, and for the maintenance of all information about the curriculum, the students, and the Professors needed by the system.

Based on the above statements, the following **Use Cases** can be identified.

Register for courses, Select Courses to teach, Request course roster, Maintain course information, Maintain Professor information, Maintain student information, Creating course catalog.

Flow of Events for a Use Case

Eg. Flow of Events for *Select Courses to teach* Use Case

Preconditions :

The Create Course offering *subflow* of the Maintain Course Information Use Case must be execute before this Use Case begins

Main Flow :

This Use Case begins when the Professor logs onto the Registration System and enters his/her password. The system verifies that the password is valid (E-1 see below) and prompts the Professor to select the current semester or a future semester (E-2). The Professor enters the desired semester. The system prompts the Professor to select the desired activity: ADD, DELETE, REVIEW, PRINT, or QUIT.

If the activity selected is ADD, the S-1: *Add a Course Offering* subflow is performed.
If the activity selected is DELETE, the S-2: *Delete a Course Offering* subflow is performed.
If the activity selected is REVIEW, the S-3: *Review Schedule* subflow is performed.
If the activity selected is PRINT, the S-4: *Print a Schedule* subflow is performed.
If the activity selected is QUIT, the use case ends

Sub Flows :

S1: Add a Course Offering

The System displays the course screen containing a field for a course name and a number. The Professor enters the name and number of a course (E-3). The system displays the course offerings for the entered course (E-4). The Professor selects a course offering. The system links the Professor to the selected course offering (E-5). The use case then begins again.

S2: Delete a Course Offering

The system displays the course offering screen containing a field for a course offering name and a number. The Professor enters the name and number of a course offering (E-6). The system removes the link to the Professor (E-7). The Use Case then begins again.

S3: Review a Schedule

The system retrieves (E-8) and displays the following information for all course offerings for which the Professor is assigned: course name, course number, course offering number, days of the week, time, and location. When the Professor indicates that he/she is through reviewing, the use case begins again.

S4: Print a Schedule

The system prints the Professor schedule (E-9). The use case begins again.

Alternative Flows :

E-1: An invalid Professor ID number is entered. The user can re-enter the semester or terminate the use case.

E-2 : An invalid semester is entered. The user can re-enter the semester or terminate the use case.

E-3 : An invalid course name/number is entered. The user can re-enter a valid name/number combination or terminates the use case.

E-4 : Course offerings cannot be displayed. The user is informed that this option is not available at the current time. The use case begins again.

E-5 : A link between the Professor and the Course offering cannot be created. The information is saved and the system will create the link at a later time. The use case continues.

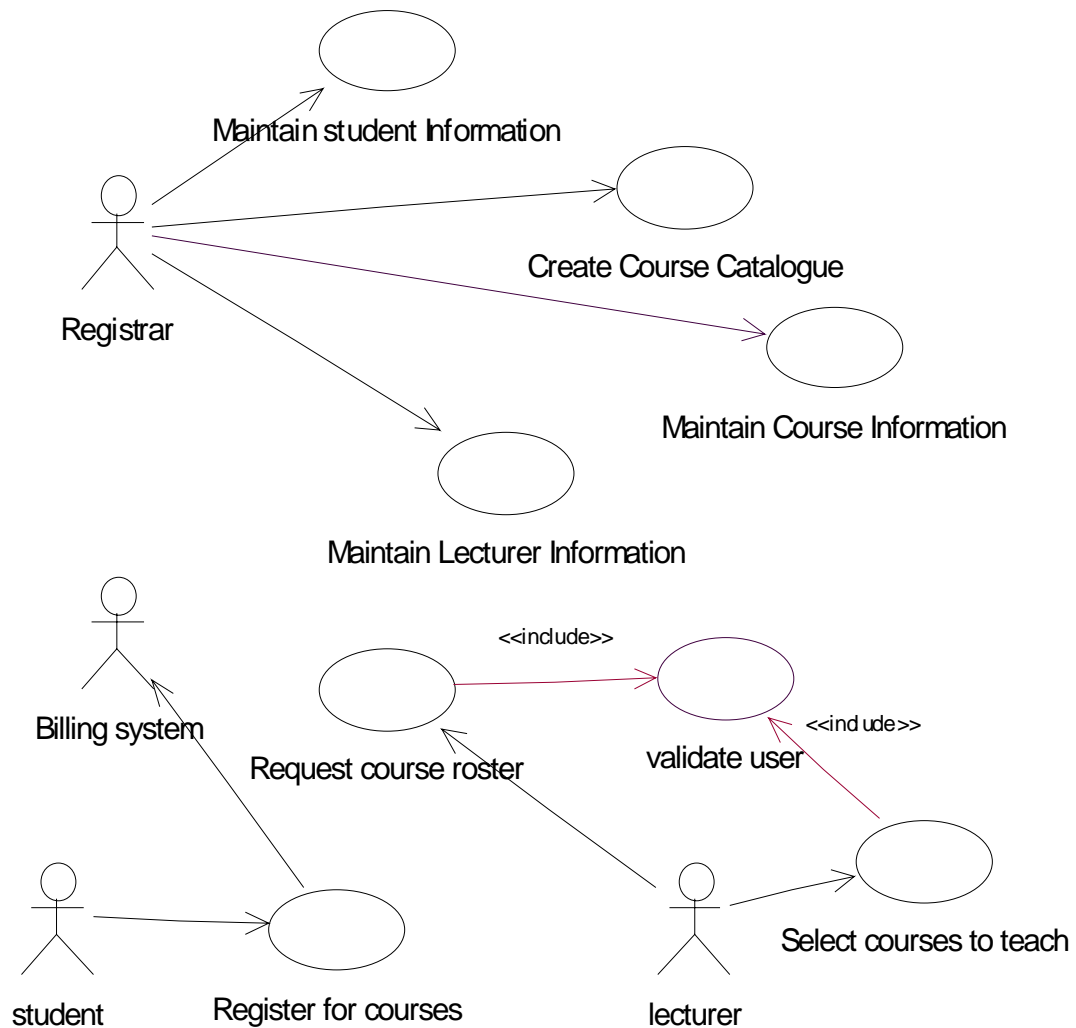
E6 : An invalid course offering name/number is entered. The user can re-enter a valid course offering name/number combination or terminate the use case.

E-7: A link between the Professor and the course offering cannot be removed. The information is saved and the system will remove the link at a later time. The use case continues.

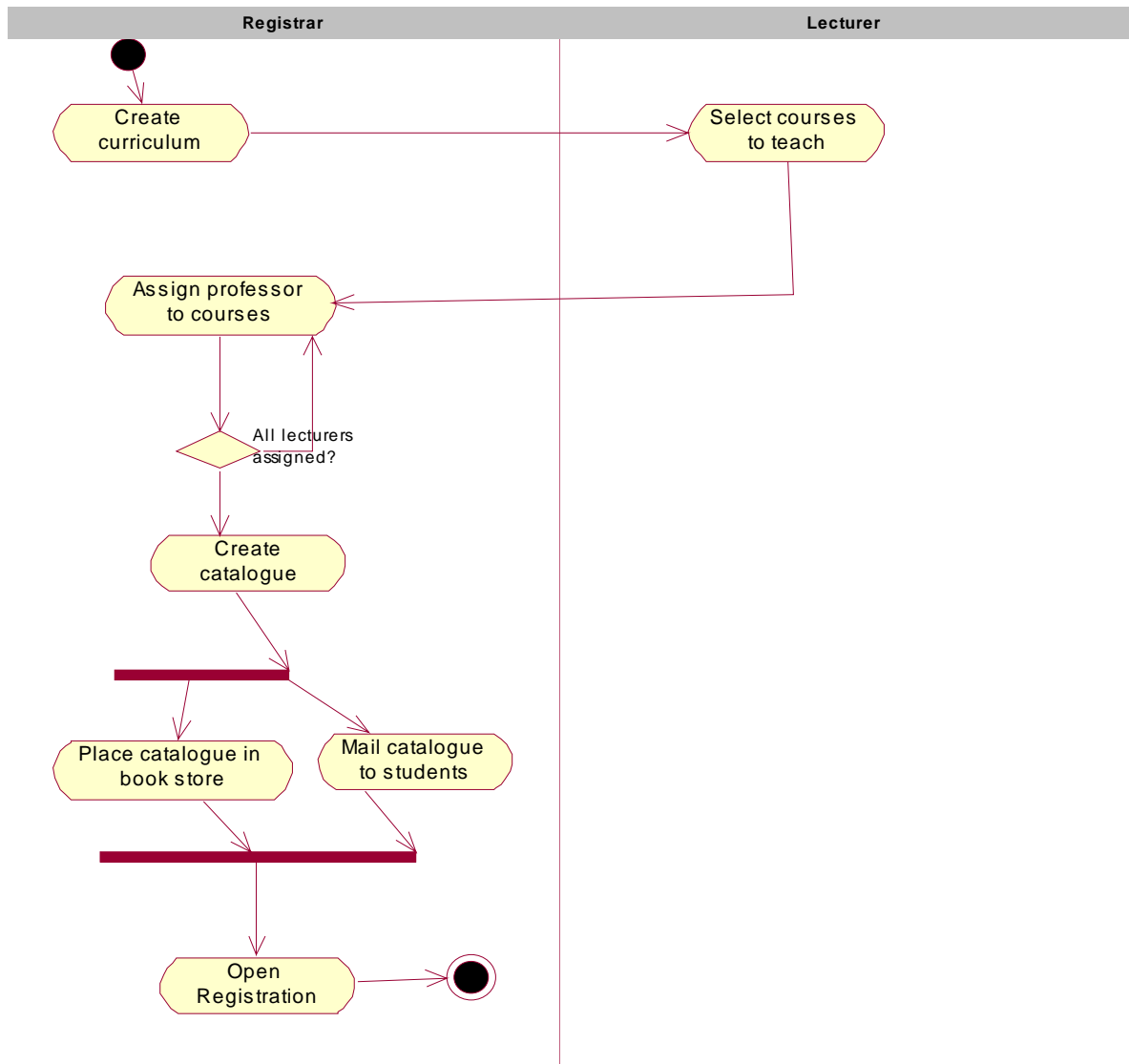
E-8 : The system cannot retrieve a schedule information. The use case then begins again.

E-9 : The schedule cannot be printed. The user is informed that this option is not available at the current time. The use case begins again.

Draw a Use Case Diagram for ESU course registration system



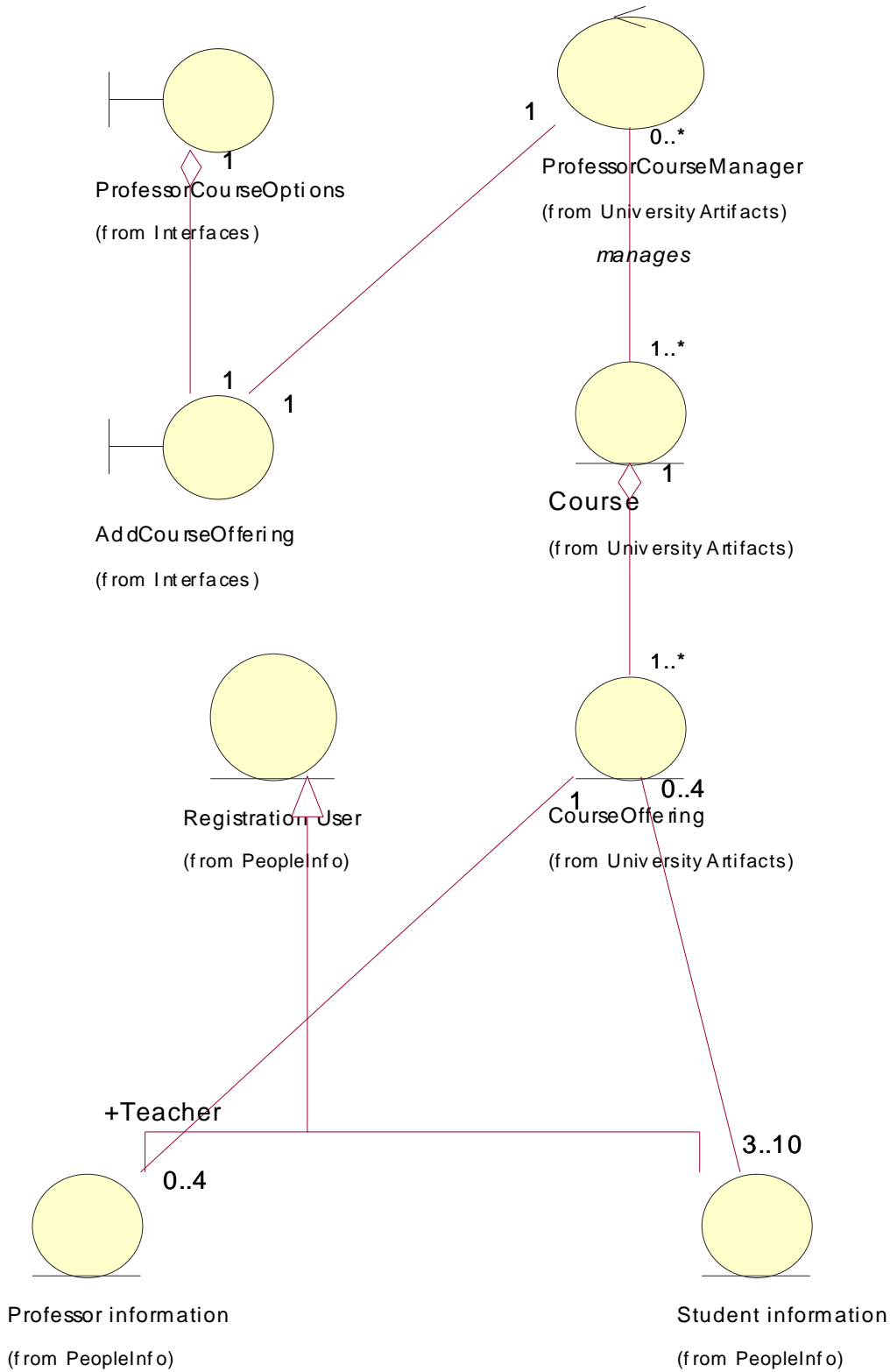
Activity Diagram for Catalogue Creation



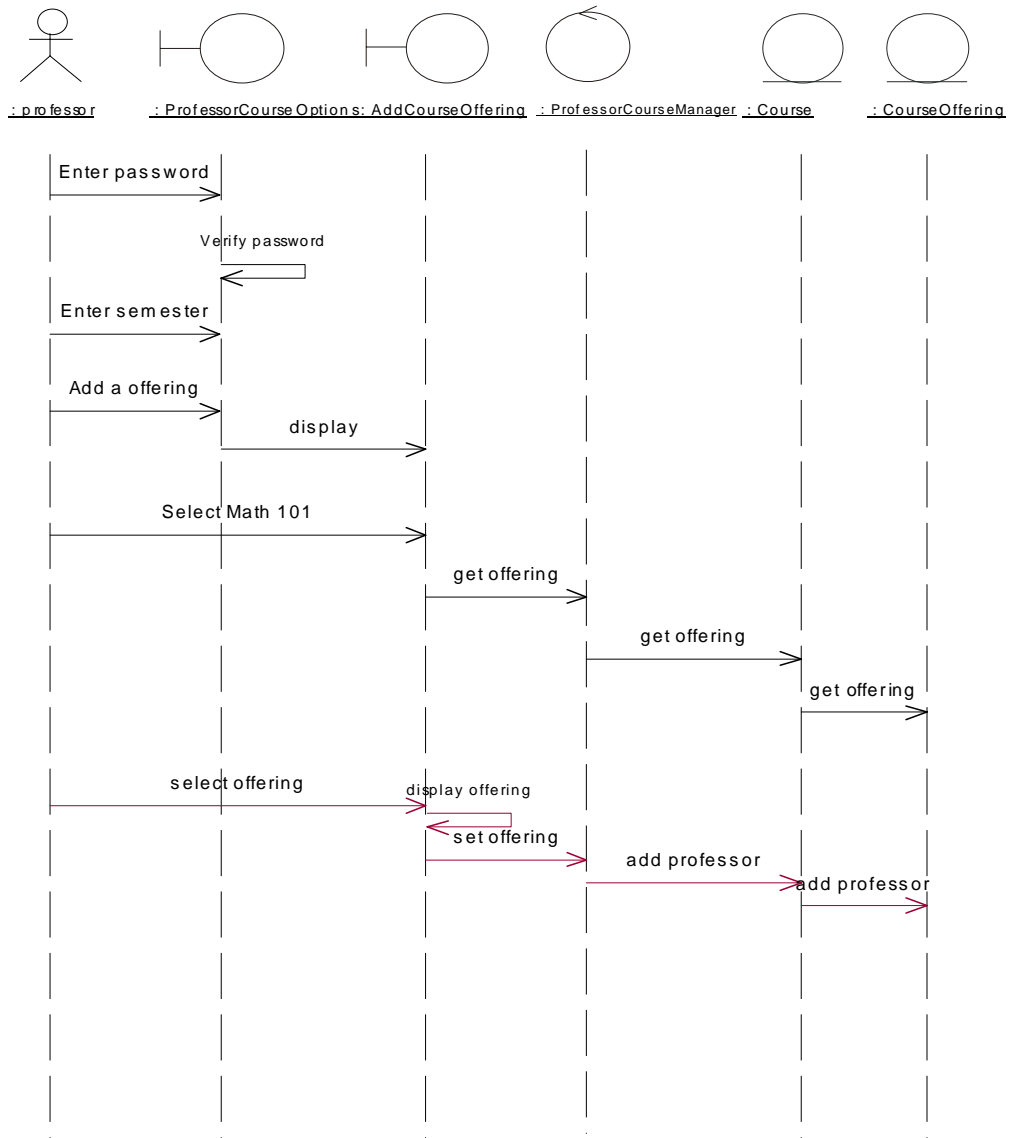
Some packages and classes for ESU course registration system.

Packages	Classes	Stereotypes
Interfaces	ProfessorCourseOptions	Boundary
	AddCourseOffering	Boundary
UniversityArtifacts	Course	Entity
	CourseOffering	Entity
	ProfessorCourseManager	Control
People	ProfessorInformation	Entity
	StudentInformation	Entity

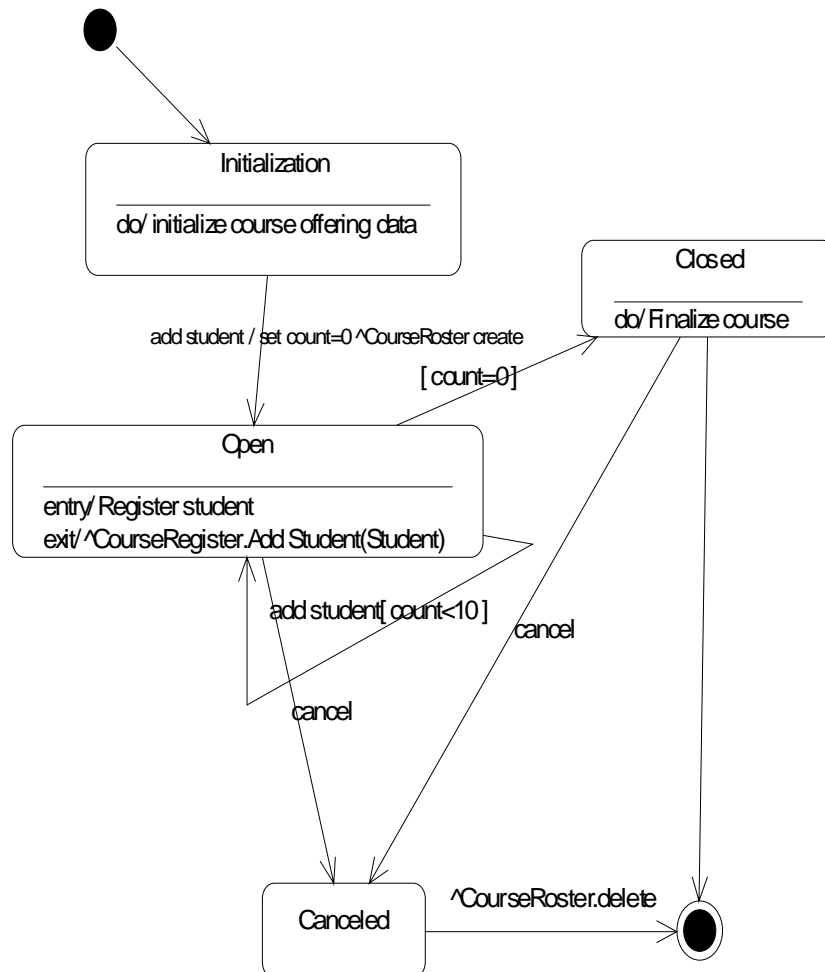
A Class Diagram



Sequence Diagram : Select courses to teach /Add course Offering



Statechart Diagram – CourseOffering object



Deployment Diagram

