

# Education Evaluation System Analysis Document

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## Summary

This document provides a proposed technical solution to process routinely collected general data to evaluate and improve the quality of college education. The aim of the document is to design a framework for the Education Evaluation System using The Unified Modeling Language(UML).

## 1. Introduction

### 1.1 Evaluation Model

Education Evaluation System (Fig.1) measures graduates' professional performance and evaluates the quality of university education. There are many factors influence the graduates' performance and education quality. We can first use the evaluation model with large amount of data to get the influence rate of each factor. After getting the weight of each factor, the evaluation model can be used to calculate graduate performance score, course score, teacher score and department score.

In the part of evaluating graduates' performance, the main factor is employments. Three factors can influence employments: job company, position level and salary per year. Company factor can be categorized under 4 headings, micro enterprise adds 1, small business adds 2, Medium-size enterprise adds 3, large enterprise adds 4 to the company score. Position level factors can be categorized under 6 headings, junior engineer adds 1, inter-media engineer adds 2, senior engineer adds 3, project manager adds 4, senior manager adds 5, project director adds 6 to the level score. As for salary per year, money under 40,000 dollars deserves 1, 40,000-60,000 dollars deserves 2, 60,000-80,000 dollars deserves 3, 80,000-10,000 dollars deserves 4, 10,000-12,000 dollars deserves 5 and above 120,000 dollars deserves 6.

In the part of evaluating faculty performance score, 4 factors need to be considered: teaching ability, student-faculty relationship awards and academics. Academics factor can be categorized under 2 headings: one is publications, the other is journals.

In the part of evaluating course score, it is basically calculated with the graduates performance score and career relevance is also influential.

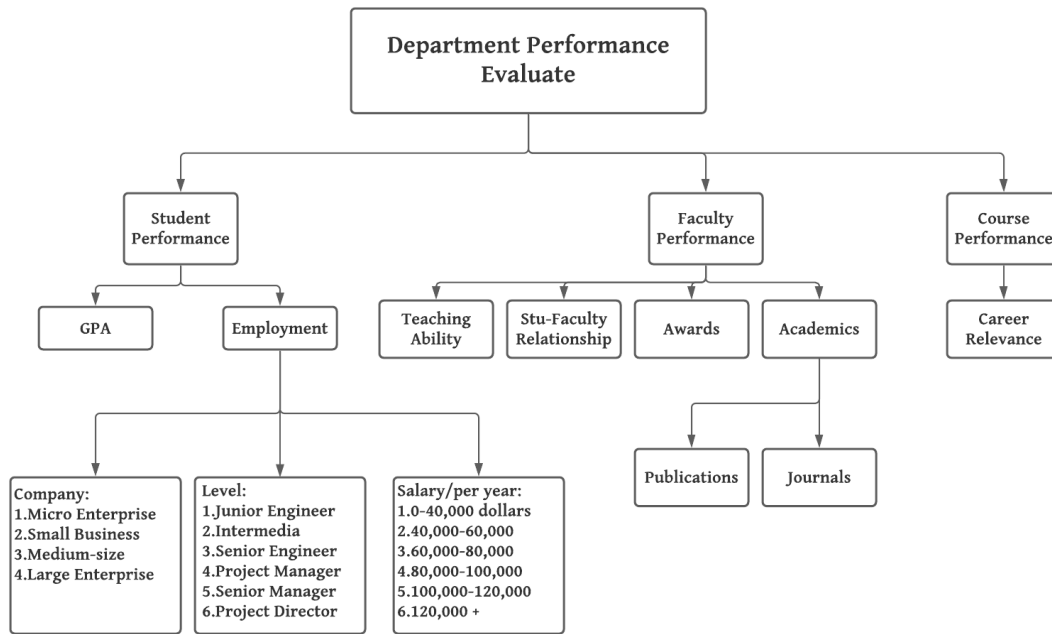


Fig.1 Model of Education Evaluation System

## 1.2 The High Level UML Diagrams for EES

The Unified Modeling Language (UML) is a standard language for specifying, visualizing, constructing, and documenting the artifacts of software systems. The UML uses mostly graphical notations to express the design of software projects. Consequently, using UML helps project teams communicate, explore potential designs, and validate the architectural design of the software. In following part, we will discuss the system through a set of high level UML diagrams: class diagram, and sequence diagram.

## 2. Class Diagram for Educational Evaluation Process

The UML allows to assess the education quality and provide the feedback for improvement. The complete assessment process for evaluating the education quality is given in Fig.1. This framework has been designed with the UML concepts. UML class diagram shows the structure of the general quality education evaluation process by illustrating classes, attributes, and relationship.

The UML model encloses ten most important classes like University, Department Directory, Department, Faculty Catalog, Faculty, Teacher, Course Schedule, Course Offer, Course Catalog, Course, Student Catalog, Student, Employment List, Employment. These classes have multiple associations and the Fig. 2 shows the complete quality evaluation process using UML.



Fig.2 Class Diagram for Education Evaluation System

### 3. Sequence Diagram for Education Evaluation Process

#### 3.1 Faculty Role

##### 3.1.1 Faculty Part: View Course List

A sequence diagram is made up of objects and messages. The sequence diagram shows how object interact with each other.

To satisfy different needs from various users, we separated user into two roles, faculty and student. The role of faculty would be able to get a course list ranked the value of course, our application would return the ranking result dynamically depending on user's needs(Fig. 3.1.1).

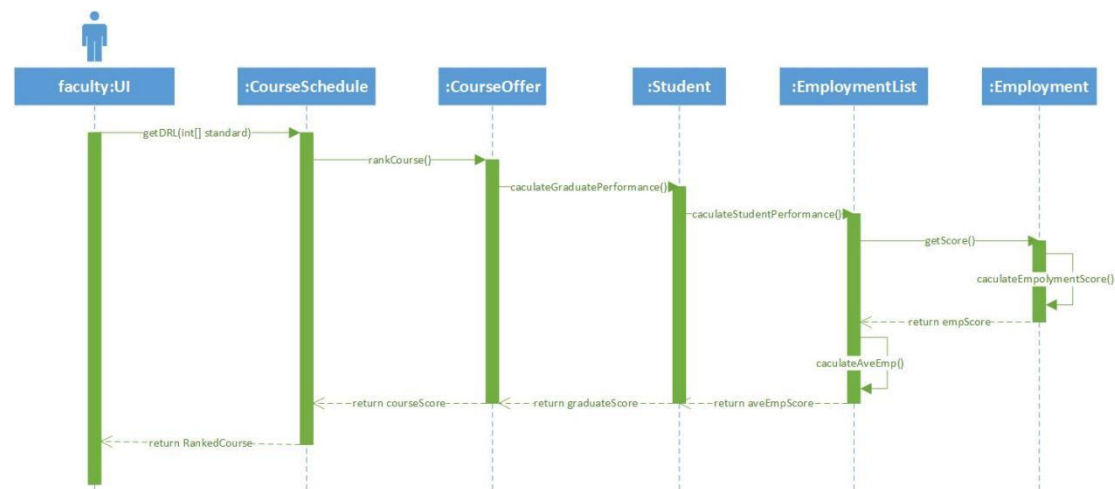


Fig. 3.1.1 Sequence Diagram for Faculty View Course List

The UI interface will use a method to request a ranked course list, and the above diagram shows all classes and methods that would be included in this process. Message and data will be transferred by methods. After User requested for ranked list, the program will call a the rankCourse() method. The rankCourse method is supposed to return a <List>, and in this method, objects of CourseOffer will call calcalateGraduatePerformance() method which would return the course score of each course. This course score is the average number of all student score. The student scores are evaluated by students' average employment. The evaluation standard would be from user, and formed as an int array.

##### 3.1.2 Faculty Part: Search Faculty

At the same time, we also provide faculty with search faculty function, which allow researchers view all faculties and rank them by their students' career development. (Fig. 3.1.2)

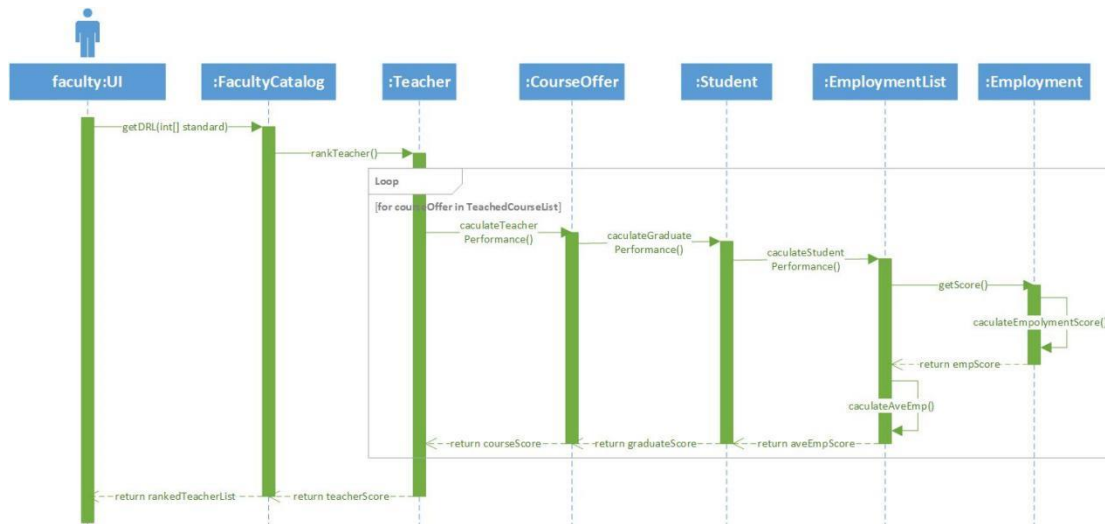


Fig. 3.1.2 Sequence Diagram for Faculty Search

The process of search faculty is basically the same as what in diagram1-1, but the program will give a score to every teacher according to courses they delivered.

### 3.1.3 Faculty Part: Search Department

To indicate the education quality of every college, we also realized the search department function for faculty. (Fig. 3.1.3)

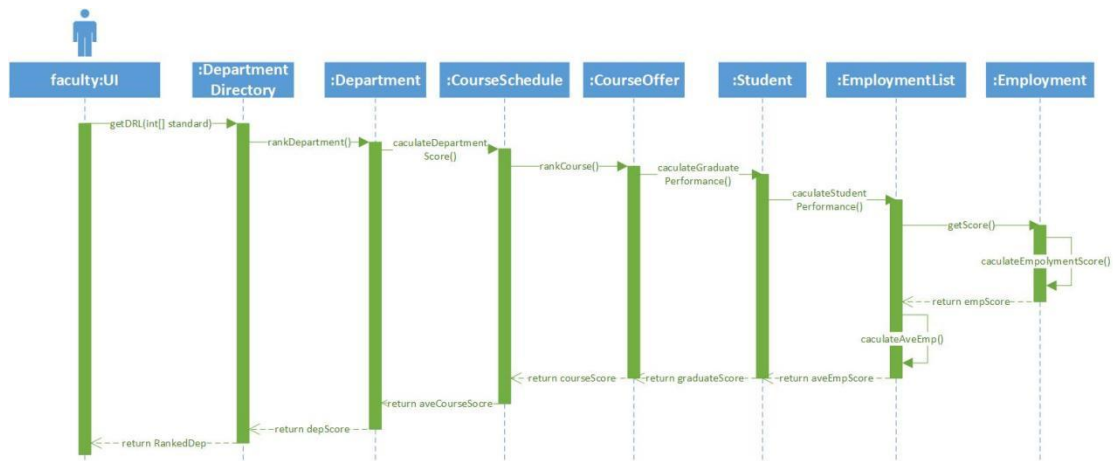


Fig. 3.1.3 Sequence Diagram for Faculty Search Department

The scores of departments would be determined by all courses under the department. And the way to get course score is mentioned above.

## 3.2 Student Role

To help students decide what course they would like to take, the program will allow students to view and rank all available courses for them. (Fig. 3.2)

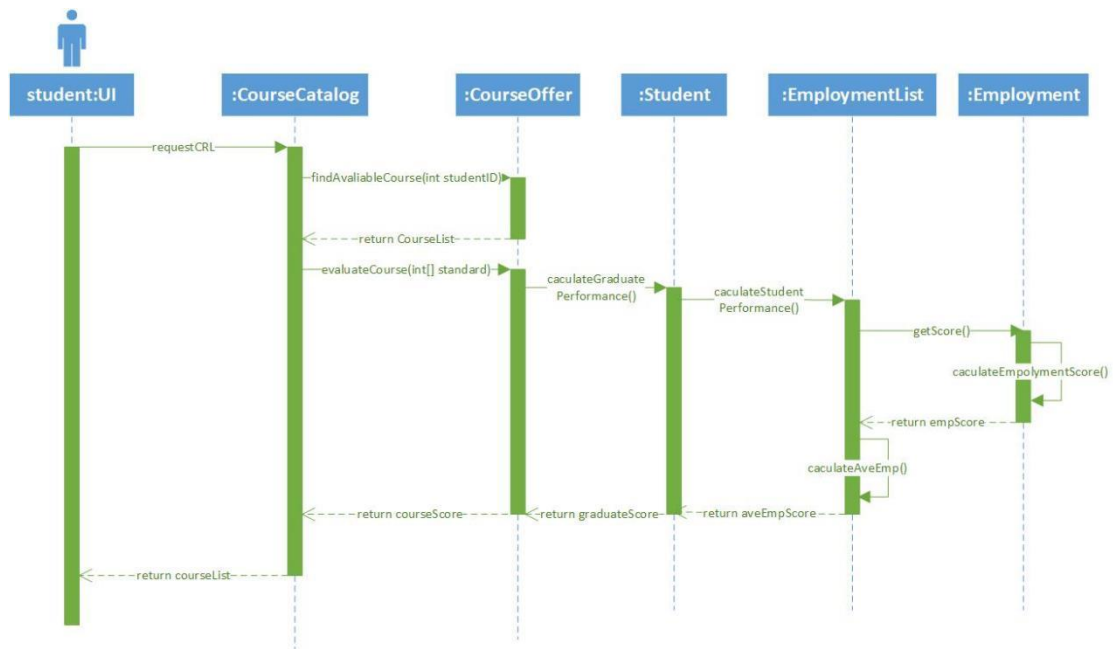


Fig. 3.2 Sequence Diagram for Student

During the process of searching for courses, the program will firstly find all available course for the student, then rank those courses by the method mentioned above, finally the CourseCatalog class will return a course list ranked by course score.

## 4. UI Dashboard

### 4.1 Main dashboard: Login

Choose the role of student or faculty to login in the education evaluation system.

(Fig. 4.1)

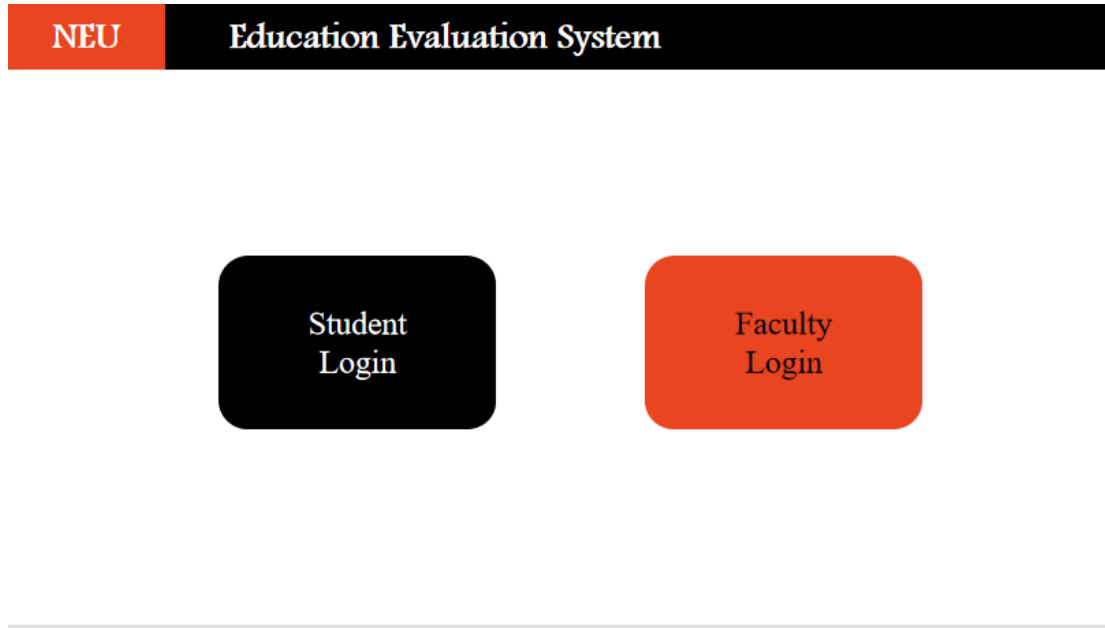


Fig. 4.1 UI for Login

## 4.2 Student Part: profile and search

### 4.2.1 Student Profile

Click the profile button, student can edit their profile information and employment experiences. Student can view details about one work experience, add a new one, modify one employment and delete one(Fig. 4.2.1).

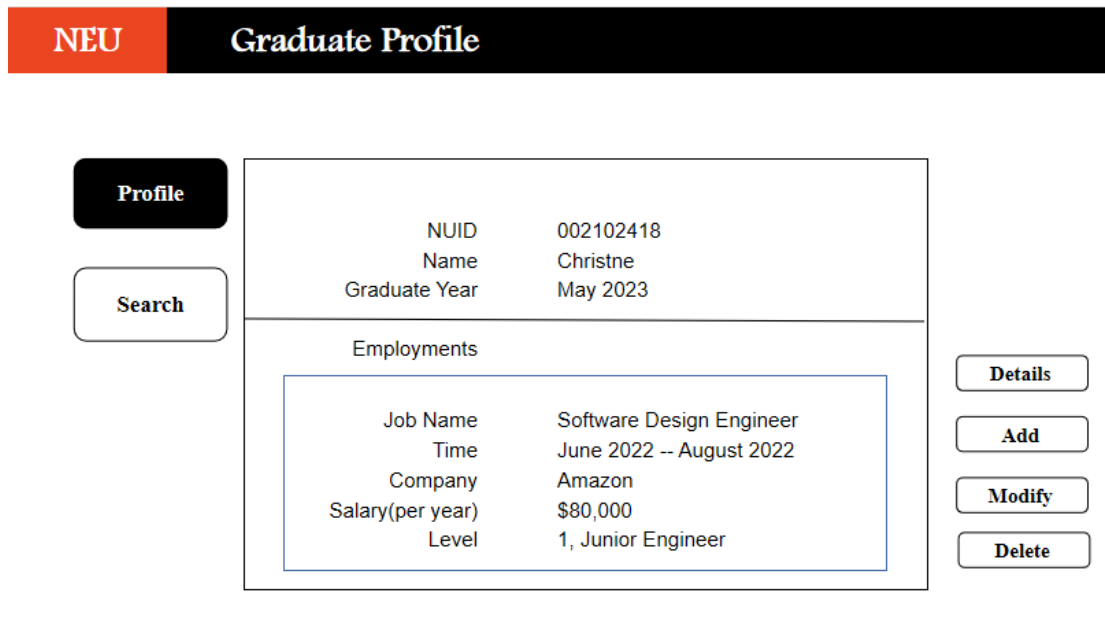


Fig. 4.2.1 UI for Student Profile

### 4.2.2 Student Search

Click on the search button, students can get specific ranking of department, teacher and courses. Students can also

justify the weight of 4 influential factors: salary, company, promotion and employment to get different ranks (Fig. 4.2.2).

NEU Education Evaluation System

Search Department Search Course Search Teacher

Search Department

Salary 70% Company 70% Promotion 70% Employment 70%

☐ OverallSearch

Department ID	Department campus	Department name
11111	Boston	college of Engineering
22222	Seattle	college of Science
33333	Boston	college of Law

Fig. 4.2.2 UI for Student Search

### 4.3 University Part: ranking department

#### 4.3.1 University Part: Overall Ranking

Click on the 5 buttons on the left of panel, the university can get the overall ranking of departments to evaluate each departments' performance. Click the details button, university can get specific score and factor weights of each department. (Fig. 4.3.1)



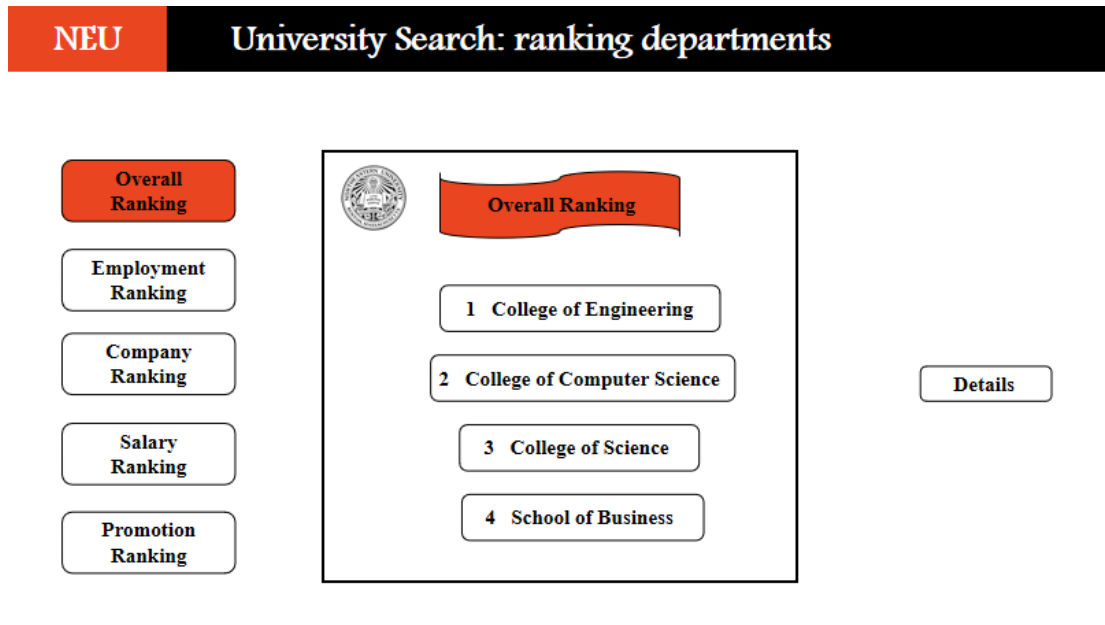


Fig. 4.3.1 UI for Overall Ranking

#### 4.3.2 University Part: ranking teachers

Click on the 5 buttons on the left of panel, the university can get the overall ranking of teachers to evaluate their performance and make improvements. Click the details button, university can get specific score and factor weights of teachers. (Fig. 4.3.2)

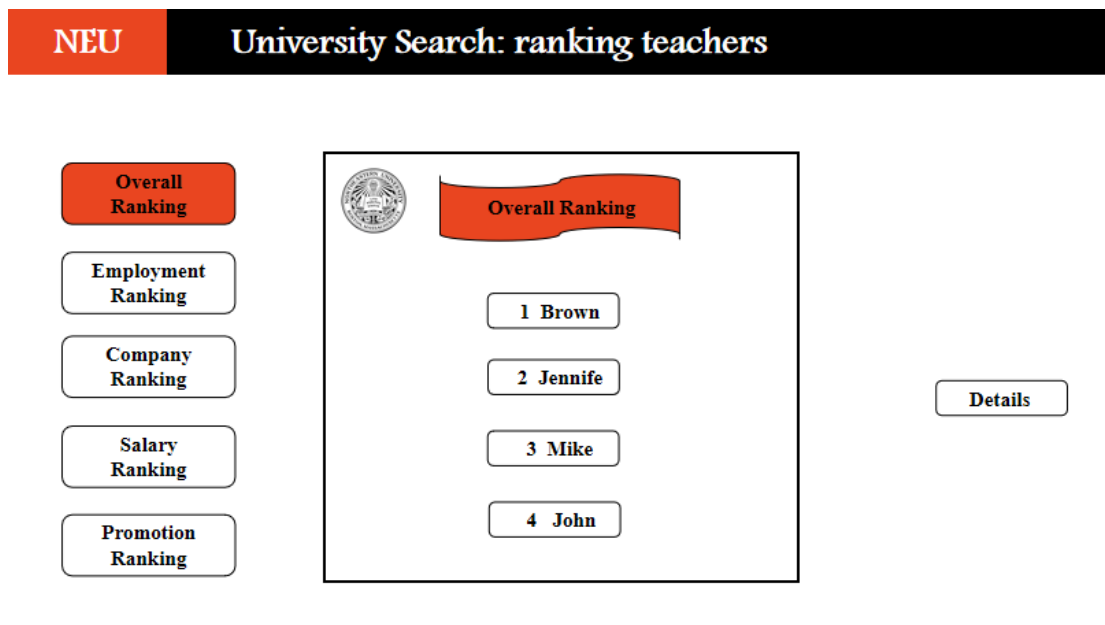


Fig. 4.3.2 UI for Ranking Teachers

#### 4.3.3 University Part: ranking courses

Click on the 5 buttons on the left of panel, the university can get the overall ranking of courses to evaluate them and make improvements. Click the details button, university can get specific score and factor weights of courses.

(Fig. 4.3.3)

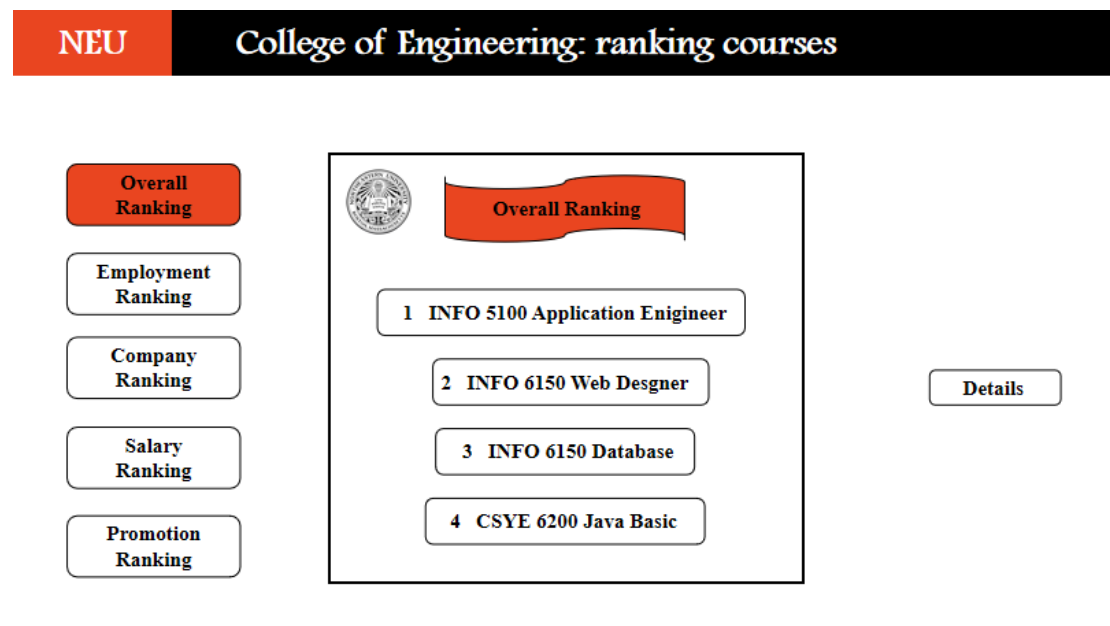


Fig. 4.3.3 UI for Ranking Courses

## 5. Conclusion

Education Evaluation System is the new challenge for higher education institutions. There are an important need to construct a system that manage the quality assurance for higher education. The first stage towards implementing such system is to define it's framework , components , attributes, and stakeholders .This system must manage the following university components : Student GPA and Employment performance, the Courses offered and the learning contents, the Faculty teaching and academic ability. EES enables the universities to compare the performance of different colleges from the aspects of faculty, courses score and students technical skills. Secondly, it is also a rank system for new students to decide which college they want to go.

From the above work, it is also concluded that the UML is a robust and dominant modeling language to answer many scientific and research problems. Class diagram can model the static view of an application, directly map with object-oriented languages. The Sequence Diagram shows how interaction operates with one another and in what order.