

(Note: this document was issued to all students prior to the examination as pre-reading material)

SPECIFICATION OF AN EXAMINATION RESULTS SYSTEM

1. Introduction

The MTech degree programme at the Institute of Systems (ISS) has over 400 registered students. To date, the examination results have been entered into the mainframe based central university examination results system by the university's Registrar's Office. ISS aims to redevelop the system using object-oriented technologies and a client/server architecture, so that the results can be entered directly by the ISS administrative staff. Hence, the existing mainframe databases will not be changed. However, a new PC based client application – the *ISS Examination Results System* (ERS) - will be created. The following sections describe the requirements for this system.

2. Summary of System Requirements

The systems requirements in terms of functional, data and other requirements are briefly summarized in the following subsections.

2.1 System Functions

The functions that are required to be provided by this system are as follows:

- 2.1.1 **Creating/Maintaining Student Details.** This function allows the user to enter and modify the student details (such as name, address, matriculation number etc) when students register each year, and whenever changes occur.
- 2.1.2 **Creating/Maintaining Course Details.** This function allows the user to define and enter details of each course (such as the course code, course name, lecturer etc) when courses are approved, and to make modifications whenever changes occur.
- 2.1.3 **Creating/Maintaining Examination Schedule.** This function allows the user to define the courses that are to be examined during each semester (6 month period of the year), and to make modifications whenever changes occur.
- 2.1.4 **Making/Modifying Course Selections.** This function allows the user to enter the courses that are selected by each student during each semester, and to make modifications whenever changes occur.
- 2.1.5 **Entering/Modifying Results by Student.** This function allows the user to enter or modify the results of a specific student.
- 2.1.6 **Entering/Modifying Results by Course.** This function allows the user to enter or modify the results of all the students taking a specific course.
- 2.1.7 **Creating BOE Report.** This function allows the user to create and print the reports on all the examination in a semester which are presented at the Board of Examiners (BOE) meeting

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- 2.1.8 **Creating Results Letters.** This function allows the user to create and print the results letter for each student, giving the results of all the examinations they have taken during a semester.

2.2 Data Requirements

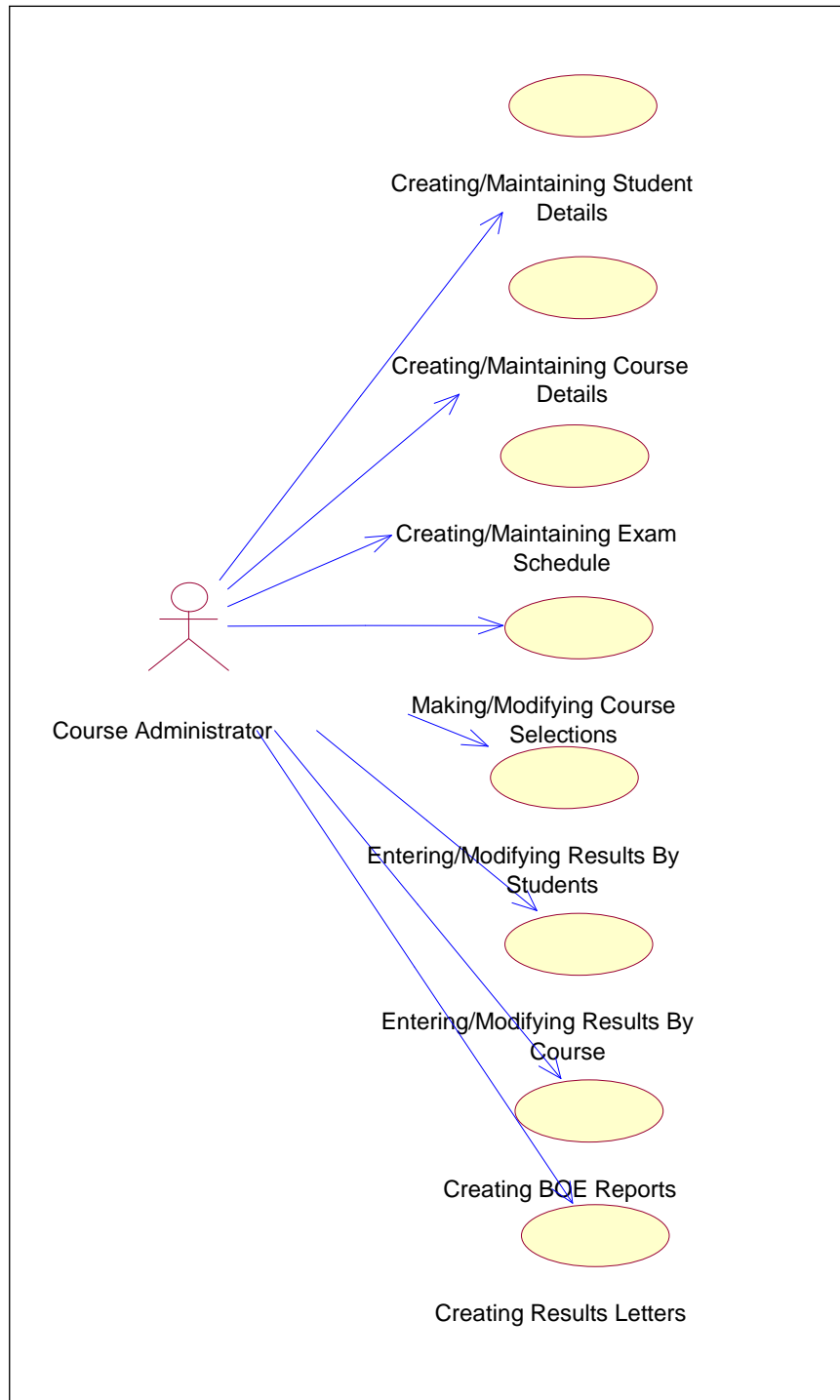
The student information, including their personal details, the courses they have selected (identified by course code) and the results of each examination they have taken, will be stored in the existing **Student Database**. The course information, including the course details and the results of all the students (identified by matriculation number) taking each examination of the course, will be stored in the existing **Course Database**.

2.3 Other Requirements

The ERS client software will be a Windows application running on PCs and communicating with the databases using ODBC.

3. Use Case Model Global View

Based on the requirements described above, use case analysis has been performed, and the actors and use cases that have been identified for the system shown in following global view diagram:



4. Use Case Descriptions

The requirements for the use cases **Making/Modifying Course Selections** and **Creating / Maintaining Course Details** shown in global view above are specified in the following subsections.

4.1 Creating/Maintaining Course Details

The standard flow of events for this use case is described below.

- 4.1.1 The Course Administrator selects the *Courses* option from **ERS Main Menu**.
- 4.1.2 The **Course Details Screen** is then displayed.
- 4.1.3 If a new course is required to be entered then the Course Administrator enters the course details into the screen (such as course code, lecturer's name etc), and then presses the *Save* button. The following then occurs:
 - a. The entered data will be read from the **Course Details Screen**.
 - b. The system will then check whether a course with this course code already exists in the **Course Database**.
 - c. If a course with this code already exists, then an appropriate message is displayed to the user in a **Message Box**, and control is returned to the **Course Details Screen**.
 - d. Otherwise, the entered data is stored in the **Course Database**.
 - e. Control then returns to the **Course Details Screen**.
- 4.1.4 If the data describing an existing course is required to be modified, then the Course Administrator enters the course code and presses the *Find* button. The following then occurs:
 - a. The system will then check whether a course with this code exists in the **Course Database**.
 - b. If a course with this code exists, then the course details are read from the **Course Database** and displayed on the **Course Details Screen**. The Course Administrator can then modify and save the data as described in paragraph (4.1.3) above.
 - c. If a course with this code does not exist, then an appropriate message is displayed to the user in a **Message Box**, and control is returned to the **Course Details Screen**.
- 4.1.5 When all the course details have been entered/modified, the Course Administrator presses the *Exit* button, and control returns to the **ERS Main Menu**.

4.2 Making/Modifying Course Selections

The standard flow of events for this use case is described below.

- 4.2.1 The Course Administrator selects the *Select* option from **ERS Main Menu**.
- 4.2.2 The **Course Selection Screen** is then displayed.

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- 4.2.3 The Course Administrator then enters the student's matriculation number and the year, and presses the *Find* button. The following then occurs:
- The student name and the course codes of the already stored course selections (for the specified year) are retrieved from the **Student Database**. If the student cannot be found, then an appropriate message is displayed to the user in a **Message Box**, and control is returned to the **Course Selection Screen**.
 - The student's name and the already selected courses are then displayed in the **Course Selection Screen**. The course codes of the courses are displayed in two *Selections* list boxes, one list box for each semester (ie: there will be a list box for each of Semester I and Semester II of the current year).
 - The course codes of all the available courses are then retrieved from the **Course Database** and displayed in two *Courses* list boxes (one list box for each semester of the current) in the **Course Selection Screen**.
- 4.2.4 The Course Administrator can use the mouse to select courses from the *Courses* list box (of the semester of interest) and then press the *Add* button to add the selected course to the *Selections* list box (of the semester of interest). If a course is selected more than once for a semester then an appropriate message is displayed to the user in a **Message Box**, and control is returned to the **Course Selection Screen**. Otherwise, the selected course is added to the *Selections* list box.
- 4.2.5 To remove a selection from a *Selections* list box, the Course Administrator uses the mouse to select the course and then presses the *Remove* button.
- 4.2.6 The Course Administrator then presses the *Save* button. The following then occurs:
- The system checks in the **Student Database** to determine whether the student has already taken and passed any of the selected courses. If so, then an appropriate message is displayed to the user in a **Message Box**, and control is returned to the **Course Selection Screen**.
 - The system then checks in the **Student Database** to determine whether the student will have selected too many courses if they pass all the courses they have so far selected. If so, then an appropriate message is displayed to the user in a **Message Box**, and control is returned to the **Course Selection Screen**.
 - The matriculation number of the student is then stored in the student list of each selected course in the **Course Database**, and the course code of each selected course is stored in the **Student Database**.
- 4.2.7 Finally, the Course Administrator presses the *Exit* button, and control returns to the **ERS Main Menu**.
- 4.2.8 If the Course Administrator *exits* before *saving* then all the data entered is discarded.

5. Class Diagram

From analyzing the use cases described in section 4, *Entity* objects have been identified, as shown in the following class diagram:

