

# **Software Requirements Specification for Exam Management System**

**Version 1.2**

Prepared by

**Emami, Chris  
Goel, Shalini  
Peixoto, Mario  
Zhang, Xuezhu**

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# Revision History

Name	Date	Reason for Changes	Version
Draft	03/02	Initial document	1.0
Second Draft	03/31	Fixing product functions and formats	1.1
Final	04/07	Fixing descriptions and rationales and other issues	1.2

# 1. Introduction

## 1.1. Purpose

The purpose of this document is to present a detailed description of the Exam Management System, a system designed to manage students and exams and provide organized records of exam results and program completion by students. It will explain the functions that faculty members and students will be able to access, the interfaces of the system, what the system will do, the constraints under which it must operate and how it will react to external stimuli. This document is intended for both students and faculty members of Texas State University and developers and will be submitted to the customer for approval.

## 1.2. Scope

The Exam Management System is a software system that will be used by faculty members and students of the Computer Science department of Texas State University. The system will help faculty members and students to track the student progress and determine when and if the student can graduate according to graduation requirements.

More specifically, the system is designed to allow the faculty members to login and create the core, programming, and communication exams. Once the exams are created, the faculty member can view the details of the registered students, edit and view each exam details and publish the results. The system is also designed to assist a faculty member to manage student record information. The system will allow faculty member to add, edit, view, and search the student record information, including the exam results. The system will also allow the faculty to view all students that have completed all the graduation requirements, therefore eligible to graduate.

The system is also designed for students, who can login, register or withdraw from an specific exam, and view its results for all exams.

## 1.3. Definitions, acronyms, and abbreviations

Term	Definition
TXStateID	Texas State University Student and Faculty Identification

## 1.4. References

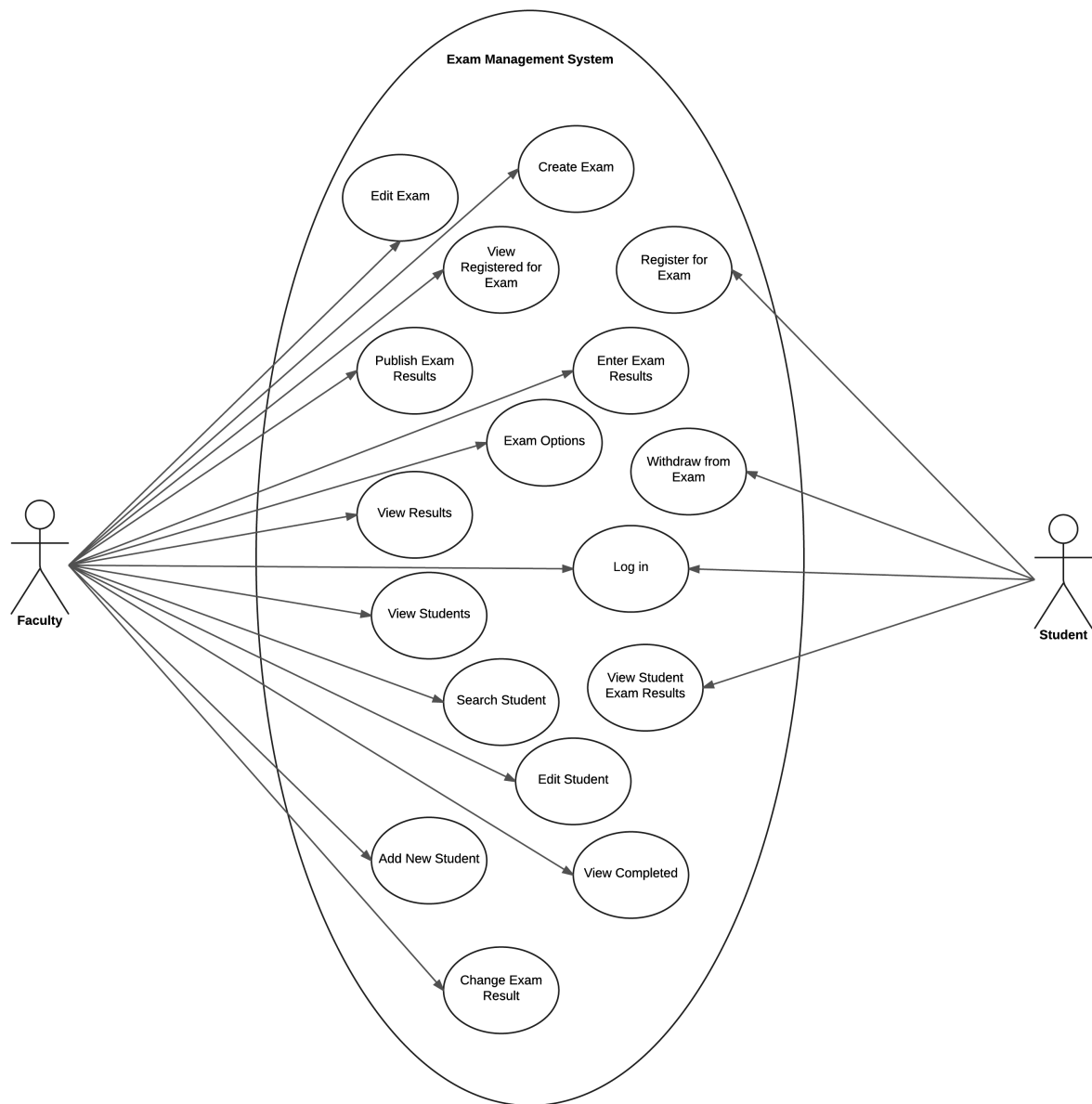
[1] IEEE Software Engineering Standards Committee, "IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specifications", June 25 1998. <https://standards.ieee.org/findstds/standard/830-1998.html>

## 1.5. Overview

The rest of the document is organized as follows: Section 2 gives an overview of the functionality of the product. It describes the informal requirements and is used to establish a context for the technical requirements specification in the following chapter.

Section 3 describes in technical terms the details of the functionalities of the product and is written primarily for the developers.

Both sections of the document describe the same software product in its entirety, but are intended for different audiences and thus use different language.



*Fig. 1. Summary of use cases*

## 2. Overall Description

### 2.1. Product Perspective

The Exam Management System is a new web-based application and does not depend or is a part of any other system. It has two different actors: faculty members and students. Both students and faculty members need a compatible web browser and internet access to access the system.

### 2.2. Product Functions

The online exam management system can be accessed by faculty members and students. The system will assist in tracking the progress of the students and determine whether the student is ready to graduate or not.



The system will provide different functions for both faculty members and students. This section outlines the product functions for faculty members and students pictured on Figure 1.

## **2.2.1. Shared functions**

### **2.2.1.1. Login**

#### **2.2.1.1.1. Description**

The user (Faculty or Student) logs in to the Exam Management System using a TxStateID and password.

**Rationale:** This function will authenticate user access to the Exam Management System.

## **2.2.2. Faculty functions**

### **2.2.2.1. Create Exam**

#### **2.2.2.1.1. Description**

The faculty member creates an exam, entering information such as the subject of the exam, when it will take place, where it will take place, the registration capacity, and the registration deadline.

**Rationale:** This function will make the exam viewable to users (student and faculty) and users will be able to perform the functions provided to them in regard to the exam.

### **2.2.2.2. Exam Options**

#### **2.2.2.2.1. Description**

The faculty member lists all exams previously created and has convenient access to exam functions such as: View Registered for Exam, Edit Exam, Enter Exam Results, View Exam Results, Publish Exam Results.

**Rationale:** This function allows a faculty member to list and manage the exams created.

### **2.2.2.3. View Registered for Exam**

#### **2.2.2.3.1. Description**

The faculty member views all the students that have already registered for the selected exam.

**Rationale:** This function provides a convenient interface for an organized record of students.

### **2.2.2.4. Edit Exam**

#### **2.2.2.4.1. Description**

The faculty member edits any exam by changing any of its attributes such as when the exam takes place, where the exam takes place, the exam's status of being cancelled or active, the exam's registration capacity, and the exam's registration deadline.

**Rationale:** This function provides the Faculty member with an option to change information of an exam to fix any misinformation and/or make changes that are necessary.

#### **2.2.2.5. Enter Exam Results**

##### **2.2.2.5.1. Description**

The faculty member enters the result of an exam for each student. The result contains information regarding if the student was present and if he/she passed or failed.

**Rationale:** This function allows the faculty member to maintain an organized record of the exam results and make the results available to all students registered for that exam.

#### **2.2.2.6. View Exam Results**

##### **2.2.2.6.1. Description**

The faculty member views the exam results and displays statistics relative to the average, the passing rate, and the total number of students marked absent.

**Rationale:** This function will give the Faculty member access to an interface of statistics and results that can be provided to and maintained by the department.

#### **2.2.2.7. Publish Exam Results**

##### **2.2.2.7.1. Description**

The faculty member publishes the results for a particular exam and makes the results available to students.

**Rationale:** This function provides the Faculty member with the ability to share exam results with the Student.

#### **2.2.2.8. View Students**

##### **2.2.2.8.1. Description**

The faculty member views all students that have been previously added to the exam management system by a faculty member.

**Rationale:** This function allows the faculty member to manage all students that have access to the system.

#### **2.2.2.9. Add new Student**

#### **2.2.2.9.1. Description**

The faculty member adds a new student to the system using the student's TxStateID, last name, first name, major, and e-mail.

**Rationale:** This function gives the faculty member the ability account for any new student that needs to be entered into the system.

#### **2.2.2.10. Search Student**

##### **2.2.2.10.1. Description**

The faculty member searches for a specific student in the system using the student's TxStateID and/or last name and first name.

**Rationale:** This function gives the faculty user the ability to access student's information with ease.

#### **2.2.2.11. Edit Student**

##### **2.2.2.11.1. Description**

The faculty member edits the attributes of a student previously added to the system, with any student's attributes being TxStateID, last name, first name, major, and e-mail.

**Rationale:** This function provides the faculty member with an option to change information of a Student to fix any misinformation and/or make changes that are necessary.

#### **2.2.2.12. Change Exam Result**

##### **2.2.2.12.1. Description**

The faculty member selects a student by any view function or by search and changes the given student's published exam result. The result options are pass or fail.

**Rationale:** This function provides the faculty member with the option to change results that are outdated or wrong.

#### **2.2.2.13. View Completed**

##### **2.2.2.13.1. Description**

The faculty member views the students who have passed the programming, communication, and core exams.

**Rationale:** This function allows the faculty member to view students who have passed all exams and are allowed to graduate.

### **2.2.3. Student functions**

### **2.2.3.1. Register for Exam**

#### **2.2.3.1.1. Description**

The student registers for an exam that has been made available by faculty members.

**Rationale:** This function provides the student ability to register for an exam that is open for registration.

### **2.2.3.2. Withdraw from Exam**

#### **2.2.3.2.1. Description**

The student withdraws from an exam that he was previously registered.

**Rationale:** This function provides the student ability to withdrawn from an exam according to its needs.

### **2.2.3.3. View Student Exam Results**

#### **2.2.3.3.1. Description**

The student views his own exam results that were already published by faculty members.

**Rationale:** This function allows the student to track his or her own progress.

## **2.3. User Classes and Characteristics**

The users are faculty members and students from the Texas State University. They have have high education degrees and know how to use a web browser.

## **2.4. Constraints**

### **2.4.1. Usability**

The system shall be implemented in a way that the faculty members and the students can fully use after 2 hours of training.

### **2.4.2. Availability**

The system shall be available 24/7 and must not exceed 30 minutes of unavailability per day.

### **2.4.3. Security**

The system shall use encrypted passwords.

#### **2.4.4. Performance**

The system response time shall not exceed 10 seconds for any user interaction event.

#### **2.5. Assumption and Dependencies**

Faculty members and students have reliable internet connection to access to the exam management system. They must have a username and password to connect to the system and permission to use appropriate functions.

## 3. Specific Requirements

### 3.1. Functions

#### 3.1.1. Shared Functions

##### 3.1.1.1. Login

<b>Function</b>	Login
<b>Description</b>	The user enters username and password. The system verifies the username and password. If the username and password are correct, the user gets logged in the system, otherwise it shows error messages.
<b>Inputs</b>	Username and Password
<b>Source</b>	User
<b>Outputs</b>	Successful login or error messages
<b>Destination</b>	Screen
<b>Pre-condition</b>	The login page is displayed on the user's screen
<b>Post-condition</b>	The user is logged into the system or error messages are displayed on the user's screen.
<b>Side-effects</b>	None

#### 3.1.2. Faculty Functions

##### 3.1.2.1. Create Exam

<b>Function</b>	Create Exam
<b>Description</b>	The Faculty enters exam type, date, start time, end time, semester, location, registration deadline. The system validates the data and creates the exam or shows error messages.
<b>Inputs</b>	Type (Programming, Communication or Core), Date (yyyy-mm-dd format), start time and end time (24hr format HH:MM:SS), Semester (Fall, Spring), Location and Registration deadline (yyyy-mm-dd format)
<b>Source</b>	User
<b>Outputs</b>	New exam or error messages
<b>Destination</b>	Database or Screen
<b>Requires</b>	Logged user with Faculty role.
<b>Pre-condition</b>	Create Exam page is displayed on the user's screen.
<b>Post-condition</b>	The exam is created or error messages are displayed on the user's screen.
<b>Side-effects</b>	None

### 3.1.2.2. Exam Options

<b>Function</b>	Exam Options
<b>Description</b>	See 2.2.2.2.1
<b>Inputs</b>	None
<b>Outputs</b>	Information for each exam: Type (Programming, Communication or Core), Date (yyyy-mm-dd format), Start and end time (24hr format HH:MM:SS), Semester (Fall, Spring), Location and Registration deadline (yyyy-mm-dd format). List of functions: View Registered for Exam, Edit Exam, Enter Exam Results and Publish Exam Results
<b>Destination</b>	Screen
<b>Requires</b>	Logged user with Faculty role.
<b>Pre-condition</b>	Exam Options page is displayed on the user's screen.
<b>Post-condition</b>	Exam Options page is displayed on the user's screen with the list of exams.
<b>Side-effects</b>	None

### 3.1.2.3. View Registered for Exam

<b>Function</b>	View Registered for Exam
<b>Description</b>	See 2.2.2.3.1
<b>Inputs</b>	Exam identifier
<b>Source</b>	Database
<b>Outputs</b>	Information for each student: Username, TXStateID, Last name, First name, Results (registered or not), Comments
<b>Destination</b>	Screen
<b>Requires</b>	Logged user with Faculty role.
<b>Pre-condition</b>	The View Registered for Exam page is displayed on the user's screen.
<b>Post-condition</b>	The View Registered for Exam page is displayed on user's screen with a list of students registered.
<b>Side-effects</b>	None

### 3.1.2.4. Edit Exam

<b>Function</b>	Edit Exam
<b>Description</b>	The system shows the current exam information: exam type, date, start time, end time, semester, location, registration deadline. The user edits the desired information. The system saves the changed data or shows error messages.

<b>Inputs</b>	Exam identifier, Type (Programming, Communication or Core), Date (yyyy-mm-dd format), Start and end time (24hr format HH:MM:SS), Semester (Fall, Spring), Location and Registration Deadline (yyyy-mm-dd format)
<b>Source</b>	Exam type, date, start time, end time, semester, location, registration deadline are input by the user. Exam identifier from the database.
<b>Outputs</b>	Edit Exam successfully or error messages
<b>Destination</b>	Database or Screen
<b>Requires</b>	Logged user with Faculty role.
<b>Pre-condition</b>	Edit Exam page is displayed on user's screen.
<b>Post-condition</b>	The exam gets updated with the new information or error messages are displayed.
<b>Side-effects</b>	None

### 3.1.2.5. Enter Exam Results

<b>Function</b>	Enter Exam Results
<b>Description</b>	The system shows a list of students registered for the exam showing only the TXStateID. The user enters the results for each student. The system saves the results.
<b>Inputs</b>	TXStateID, Exam identifier, Exam result (noshow, passed, failed)
<b>Source</b>	Exam result is input by the user. TXStateID and exam identifier from the database.
<b>Outputs</b>	Results successfully saved or error messages
<b>Destination</b>	Database or Screen
<b>Requires</b>	Logged user with Faculty role.
<b>Pre-condition</b>	Enter Exam Results page is displayed on the user's screen.
<b>Post-condition</b>	The results are saved to the database or error messages are displayed.
<b>Side-effects</b>	None

### 3.1.2.6. View Exam Results

<b>Function</b>	View Exam Results
<b>Description</b>	The system shows a list of students registered for the exam and a summary of the exam results: result (noshow, passed, failed), total results, how many passed, how many failed, how many noshow.
<b>Inputs</b>	Exam identifier
<b>Source</b>	Database
<b>Outputs</b>	Username, TXStateID, Last name, First name, Result. Total Results, How many passed, How many failed, how many noshow.



<b>Destination</b>	Screen
<b>Requires</b>	Logged user with Faculty role.
<b>Pre-condition</b>	The View Exam Results page is displayed on the user's screen.
<b>Post-condition</b>	The student list with individual results and summary are displayed on the user's screen.
<b>Side-effects</b>	None

### 3.1.2.7. Publish Exam Results

<b>Function</b>	Publish Exam Results
<b>Description</b>	See 2.2.2.7.1
<b>Inputs</b>	Exam identifier
<b>Source</b>	Database
<b>Outputs</b>	Publish Exam Results successfully
<b>Destination</b>	Database
<b>Requires</b>	Logged user with Faculty role.
<b>Pre-condition</b>	The Publish Exam Results page is displayed on the user's screen.
<b>Post-condition</b>	The results for the selected exam are published.
<b>Side-effects</b>	The results for the selected exam becomes available for the students.

### 3.1.2.8. View Students

<b>Function</b>	View Students
<b>Description</b>	See 2.2.2.8.1.
<b>Inputs</b>	None
<b>Source</b>	None
<b>Outputs</b>	Username, TXStateID, Last name, First name, Major, Email, Result of programming exam, Result communication exam, Result of core exam and Exam history (exam name, exam date, exam result)
<b>Destination</b>	Screen
<b>Requires</b>	Logged user with Faculty role.
<b>Pre-condition</b>	The View Students page is displayed on the user's screen.
<b>Post-condition</b>	The student list with all data is displayed on the user's screen.
<b>Side-effects</b>	None

### 3.1.2.9. Add new Student

<b>Function</b>	Add new Student
<b>Description</b>	The Faculty enters student data: username, txstateid, last name, first name, major, email, result of programming exam, result of communication exam, result of core exams, local phone, local address, local city, local state, local zip. The system saves the new student or display error messages.
<b>Inputs</b>	Username, TXStateID, Last name, First name, Major, Email, Result of Programming Exam, Result of Communication Exam, Result of Core Exams, Local phone, Local address, Local city, Local state, Local zip.
<b>Source</b>	User
<b>Outputs</b>	New Student or error messages
<b>Destination</b>	Database or Screen
<b>Requires</b>	Logged user with Faculty role.
<b>Pre-condition</b>	Add New Student page is displayed on the user's screen.
<b>Post-condition</b>	The new student is created to the database or error messages are displayed on the user's screen.
<b>Side-effects</b>	None

### 3.1.2.10. Search Student

<b>Function</b>	Search Student
<b>Description</b>	The Faculty enters search data: username, TXStateID, last name, first name, major, email, result of programming exam, result of communication exam, result of core exams. The system shows a list of students in the database according to that search criteria.
<b>Inputs</b>	Username, TXStateID, Last name, First name, Major, Email, Result of Programming Exam, Result of Communication Exam and Result of Core Exams.
<b>Source</b>	User
<b>Outputs</b>	Each student information: Username, TXStateID, Last name, First name, Major, Email, Result of Programming Exam, Result of Communication Exam, Result of Core Exams.
<b>Destination</b>	Screen
<b>Requires</b>	Logged user with Faculty role.
<b>Pre-condition</b>	The Search student page is displayed on the user's screen.
<b>Post-condition</b>	The student list according to the search criteria is displayed on the user's screen.
<b>Side-effects</b>	None

### 3.1.2.11. Edit Student

<b>Function</b>	Edit Student
<b>Description</b>	The Faculty enters Username or TXStateID. The system loads the student information: username, TXStateID, last name, first name, major, email, programming exam result, communication exam result, core exam results, local phone, local address, local city, local state, local zip. The Faculty edits the student information except for username and TXStateID. The system saves the student information or shows error messages.
<b>Inputs</b>	Username, TXStateID, Last name, First name, Major, Email, Programming Exam Result, Communication Exam Result, Each core exam result, Local phone, Local address, Local city, Local state, Local zip
<b>Source</b>	User
<b>Outputs</b>	Edit Student successfully or error messages
<b>Destination</b>	Database or Screen
<b>Requires</b>	Logged user with Faculty role.
<b>Pre-condition</b>	The Edit Student page is displayed on the user's screen
<b>Post-condition</b>	The student gets updated with the new information or error messages are displayed.
<b>Side-effects</b>	None

### 3.1.2.12. Change Exam Result

<b>Function</b>	Change Exam Result
<b>Description</b>	The Faculty enters Username or TXStateID. The system loads the student information. The Faculty edits the result information: Programming Exam Result, Communication Exam Result, Core Exam results. The system saves the results.
<b>Inputs</b>	Username, TXStateID, Programming Exam Result, Communication Exam Result, Core Exam Results.
<b>Source</b>	User
<b>Outputs</b>	Change Exam Result successfully or error messages
<b>Destination</b>	Database or Screen
<b>Requires</b>	Logged user with Faculty role.
<b>Pre-condition</b>	The Change Exam Result page is displayed on the user's screen
<b>Post-condition</b>	The student results gets updated with the new information or error messages are displayed.
<b>Side-effects</b>	None

### 3.1.2.13. View Completed

<b>Function</b>	View Completed
<b>Description</b>	See 2.2.2.13.1

<b>Inputs</b>	None
<b>Outputs</b>	Information for each student: Username, TXStateID, Last name, First name, Major, Email, Result of programming exam, Result of communication exam, Result of core exams
<b>Destination</b>	Screen
<b>Requires</b>	Logged user with Faculty role.
<b>Pre-condition</b>	The View Completed page is displayed on the user's screen
<b>Post-condition</b>	The students that have passed all exams are displayed on the user's screen.
<b>Side-effects</b>	None

### 3.1.3. Student Functions

#### 3.1.3.1. Register For Exam

<b>Function</b>	Register for Exam
<b>Description</b>	The system shows all exams open for registration. The Student chooses the Exam to register. The system registers the student on the desired exam and makes it available for Faculty.
<b>Inputs</b>	Student identifier, Exam identifier.
<b>Source</b>	Database
<b>Outputs</b>	Successful registration
<b>Destination</b>	Screen and Database
<b>Requires</b>	Logged user with Student role and Exam open for registration.
<b>Pre-condition</b>	The Register for Exam page is displayed on the user's screen
<b>Post-condition</b>	The student is registered for the exam
<b>Side-effects</b>	The student registration becomes available for the Faculty.

#### 3.1.3.2. Withdraw from Exam

<b>Function</b>	Withdraw from Exam
<b>Description</b>	The system shows all exams that the user is registered and the registration deadline has not passed yet. The Student chooses the Exam to withdraw. The system withdraws the student from the desired exam and makes it available for Faculty or shows error messages.
<b>Inputs</b>	Student identifier, Exam identifier.
<b>Source</b>	Database
<b>Outputs</b>	Successful withdrawn or error messages
<b>Destination</b>	Screen and Database

<b>Requires</b>	Logged user with Student role, Student already registered for the Exam and registration deadline has not passed yet.
<b>Pre-condition</b>	The Withdraw from Exam is displayed on the user's screen
<b>Post-condition</b>	The student is withdrawn from the exam or error messages are displayed
<b>Side-effects</b>	The student withdrawn becomes available for the Faculty.

### 3.1.3.3. View Student Exam Results

<b>Function</b>	View Student Exam Results
<b>Description</b>	See 2.2.3.3.1
<b>Inputs</b>	Student identifier.
<b>Source</b>	Database
<b>Outputs</b>	Result of programming exam, Result of communication exam, Result of core exams
<b>Destination</b>	Screen
<b>Requires</b>	Logged user with Student role.
<b>Pre-condition</b>	The View Student Exam Results page is displayed on the user's screen
<b>Post-condition</b>	The exam results for the logged student are displayed on the user's screen
<b>Side-effects</b>	None