

# Online Exam Board

## Software Requirement Specification

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# 1. Introduction

## 1.1. Purpose

The purpose of this document is to specify the requirements of the online exam management system. This Software Requirement Specification will describe the functionality, performance, external interfaces, attributes, and any design constraints on implementation. The intended audiences of this document are the development team members of the project who will be implementing the software product as well as the stakeholders, including Faculty Members and administrators in charge of decisions and requirements involved with adopting the new system.

## 1.2. Scope

The Exam Management System is named Online Exam Board. The framework of the system is designed for the purpose of managing exams and student results. The intended users of the system are faculty and students. The system will manage three exam types which consist of programming, communication, and core exams. A student is eligible for graduation only if he/she has passed all three exams. The system will benefit both sets of users, providing them with various system interfaces as well as a relational database to access the student exam information, thereby saving time while providing both consistency and accuracy in communicating the different elements of data.

Online Exam Board is designed to provide the faculty with features that allow them to create an exam and to manage an existing exam by editing exam, viewing the registered students for exam, entering results, viewing results, and publishing results. The system is also designed to allow faculty to access student records as well as to provide the features of viewing all record information for a given student, adding a new student record, searching for a student record, editing a student record, editing student exam result, and view students who have passed all exams.

Online Exam Board provides students with features that allow them to register for an exam, withdraw from an exam, and to view exam results and statistics. However, the system does not allow a student to edit information in their own student record.

## 1.3. Definitions, Acronyms, and Abbreviations

This document uses the following definitions, acronyms, and abbreviations:

TxstateID	Texas state student ID with format Axxxxxxx
Exam identifier	Exam number

Online Exam Board	Name of the website
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## 1.4. References

The following material was used in creating this document:

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

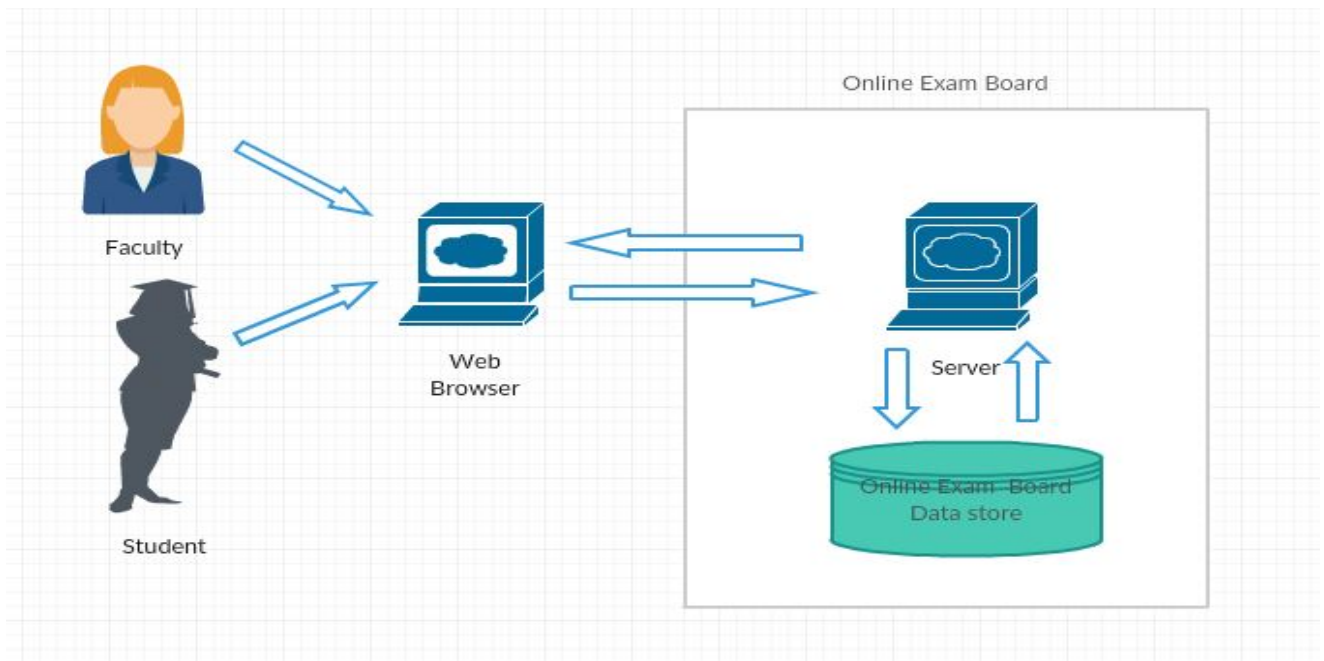
## 1.5. Overview

This document is designed to provide information to both the client and the technical designers of the software. There are three sections in this document viz Introduction, Overall Description and Specific requirements.

# 2. Overall Description

## 2.1. Product Perspective

Online Exam Board is a new self-contained product, not a component of any larger system.



## 2.2. Product Functions

## **Faculty:**

### **2.2.1. Faculty Login**

The faculty login function allows faculty to login using their username and password. Once logged in, faculty has access to the system which allows them to manage the exam and student features.

Rationale: This provides a method by which the faculty can access the restricted operations.

### **2.2.2. Manage All Exams**

This set of features allows faculty to manage all exam options.

#### **2.2.2.1. Create Exam**

The create exam function allows a faculty member to create a new programming, communication, or core exam in the system. Newly created exams will appear in the student interface

Rationale: This provides a method by which the faculty can create upcoming programming or communication exams to let students register for an exam because the exams are part of the graduation requirement.

#### **2.2.2.2. Manage Created Exams**

These features allow faculty to manage exams that have already been created.

##### **2.2.2.2.1. View Registered Students**

The view registered function allows faculty to view all of the students who are registered to take a given exam. The displayed student information will include: username, student ID, first name, last name, exam registration status, comments, and the total registered students count.

Rationale: This provides a method by which the faculty can view details about students registered for a given exam.

##### **2.2.2.2.2. Edit Exam**

The edit exam function allows a faculty member to edit the information for an existing exam. The editable information includes the exam type, date, start time, end time, semester, location, and the registration deadline.

Rationale: This provides a method by which the faculty can edit exam details for an existing exam. There may be a change in schedule, location,

date, or other details for an exam. This function helps to keep exam details update to date.

#### **2.2.2.2.3. Enter Exam Results**

The enter results function allows a faculty member to enter the results of a given exam. For a registered student ID, the results are no-show, pass, or fail.

Rationale: This provides a method by which the faculty can enter results for an exam. Once an exam is evaluated, it is necessary to maintain a record of the results.

#### **2.2.2.2.4. View Exam Results**

The view results function displays the results of a given exam. The information displayed includes, username, student ID, full name, and test result. Exam statistics will also be displayed including the total results and the number of pass, fail, and no-show students.

Rationale: This provides a method by which the faculty can view results of an exam. Statistics provide a view of how well the students as a whole performed on the exam.

#### **2.2.2.2.5. Publish Exam Results**

The publish results function allows a faculty member to publish the results for a given exam. The students will see the published results in their interfaces.

Rationale: This provides a method by which the faculty can publish results for a given exam. Students who participated in an exam can view their results. This is essential for students to keep track of the status of their graduate requirements.

### **2.2.3. Manage Student Records**

These features allow faculty to manage all of the information for a student record.

#### **2.2.3.1. View All**

The view all function displays all information for a given student that is stored in their student record including student ID, username, first name, last name, major, email, exam history, and the student's results of the programming, communication, and core exams.

Rationale: This provides a method by which the faculty can view all information pertaining to a student. This enables faculty to view student exam history.

#### **2.2.3.2. Add New Student Record**

The add new function lets a faculty member add a new student record. The information for a new student record includes student ID, username, first name, last name, major, email, local phone number, local address, and the student's results of the programming, communication, and core exams.

Rationale: This provides a method by which the faculty can add a new student record. New students every semester need to be entered into the system because there is no interaction between university registrar data that is external to Online Exam Board system.

#### **2.2.3.3. Search Student Records**

The search function allows a faculty member to search for a student record given a student ID, username, first name, last name, major, email, programming exams, communication exams, and each core course.

Rationale: This provides a method by which the faculty can search for a student record. This is useful when a faculty needs to lookup details about a student.

#### **2.2.3.4. Edit Student Record**

The edit function allows a faculty member to edit the record for a student given his or her student ID or username. The editable information includes last name, first name, major, email, programming exam result, communication exam result and result for each core course, local phone number, and local address.

Rationale: This provides a method by which the faculty can edit student records. The faculty will need to update student details in some instances to keep the data in the system up to date. For instance, when a student has changed his/her address.

#### **2.2.3.5. Change Exam Result**

The change result function allows a faculty member to change an exam result for a student given his or her student ID or username. Results of all exams can be changed here (programming, communication, and each core course).

Rationale: This provides a method by which the faculty can edit student exam results. The faculty may need to update student results in many instances to keep the data in the system up to date. For example, when a student has requested a grade review.



#### **2.2.3.6. View Completed**

The view completed function allows a faculty member to view all of the students who have passed the programming, communication, and the core exams. The student record information displayed for the students who have passed includes student ID, username, first name, last name, major, email, result of programming exam, result of communication exam, and result of core course.

Rationale: This provides a method by which the faculty can view all the students who have passed the programming, communication, and core exams. This is useful when a faculty member needs to gather a list of students who have completed the exam requirements for graduation.

### **Students:**

#### **2.2.4. Student Login**

The student login function allows a student to enter their username and password. Once verified, the authenticated students will be able to register for exams, withdraw from exams, and view exam results.

Rationale: This provides a method by which the student is verified to access the system.

#### **2.2.5. Register Exam**

The register exam function allows the authenticated student to register for an exam that has been already created.

Rationale: This provides the student with the facility to register for an available exam that he/she wishes to take. Registering for an exam is necessary in order to attend the exam.

#### **2.2.6. Withdraw Exam**

The withdraw exam function allows the authenticated student to withdraw from an exam.

Rationale: This provides student with the facility to withdraw from exams that he/she has already registered. A student withdraws from an exam if he/she is unable to take the exam.

#### **2.2.7. View Exam Results**

The view exam results function displays the authenticated student's exam result once it has been published by a faculty member.

Rationale: This provides the student with the facility to view the results of the exam once it has been published.

### **2.3. User Characteristics**

Faculty and Student are the two types of users that interact with the exam management system. Both are expected to be internet literate and be able to navigate webpages and fill forms.

### **2.4. Constraints**

- The system is developed as student project with a limited budget, and therefore is constrained to low-cost methods of implementation.

### **2.5. Assumptions and Dependencies**

Since the exam management system is only accessible through the Internet, it is assumed that the end user has a connection to the Internet. It is also assumed that the user has a web browser able to display the website (Google Chrome Version 49.X or higher or any other compatible browsers).

## **3. Specific Requirements**

### **3.1. External Interfaces**

Online Exam Board is an independent product and has no external interfaces.

### **3.2. Functions**

#### **3.2.1. Faculty Functions**

##### **3.2.1.1. Faculty Login**

<b>Function</b>	Faculty Login
<b>Description</b>	Shall log a Faculty member into the system. A Faculty member logs into the system using username and password.
<b>Inputs</b>	Faculty username, Faculty password
<b>Source</b>	Faculty username and Faculty password are entered by the Faculty.

<b>Outputs</b>	Login-state of the Faculty.
<b>Destination</b>	Faculty dashboard. Once login-state of the Faculty is set, they are redirected to user dashboard.
<b>Requires</b>	Username and password match a Faculty user in the system database.
<b>Pre-Condition</b>	The Faculty is not already logged-in. The login-page is displayed. Faculty enters the correct username and password.
<b>Post-Condition</b>	The system shall save the login-state of the the Faculty. The Faculty interface is displayed.
<b>Side-Effects</b>	None

#### 3.2.1.2. Create Exam

<b>Function</b>	Create Exam
<b>Description</b>	Shall allow a Faculty member to create a new programming, communication, or core exam in the system.
<b>Inputs</b>	Exam type, Exam date, Exam start time, Exam end time, Exam semester, Exam location, Exam registration deadline.
<b>Source</b>	Faculty member enters inputs.
<b>Outputs</b>	The system shall add a new Exam in the system.
<b>Destination</b>	Online Exam Board database.
<b>Requires</b>	Valid inputs: the system shall check for valid input.
<b>Pre-Condition</b>	“Create exam” option is displayed.
<b>Post-Condition</b>	The system shall confirm the successful creation of new exam.
<b>Side-Effects</b>	New exam will now appear in Student display.

#### 3.2.1.3. View Registered Students

<b>Function</b>	View Registered Students
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<b>Description</b>	Shall display for a Faculty member all of the students registered for a given exam.
<b>Inputs</b>	Exam identifier
<b>Source</b>	Faculty member selects an exam from a list of exams in their display.
<b>Outputs</b>	The system shall display a list of Student information: username, student ID, first name, last name, registration status, comments, and the total registered student count.
<b>Destination</b>	Output displayed onto screen.
<b>Requires</b>	At least one exam to have been created in the system.
<b>Pre-Condition</b>	A list of exams is displayed.
<b>Post-Condition</b>	No changes are made to the exam or Student record; output is displayed.
<b>Side-Effects</b>	None

#### **3.2.1.4. Edit Exam**

<b>Function</b>	Edit Exam
<b>Description</b>	Shall allow a Faculty member to edit an existing exam.
<b>Inputs</b>	Exam identifier, edits to that specific exam
<b>Source</b>	Faculty member input: selects the exam to edit from a list of exams that are displayed.
<b>Outputs</b>	None
<b>Destination</b>	Online Exam Board database
<b>Requires</b>	At least one exam to have been created in the system to edit and valid edit inputs.
<b>Pre-Condition</b>	A list of exams are displayed.
<b>Post-Condition</b>	The specified changes are made to the exam.
<b>Side-Effects</b>	Updated exam details are presented wherever this exam is

displayed.

#### 3.2.1.5. View Exam Results

<b>Function</b>	View Exam Results
<b>Description</b>	Shall allow a Faculty member to view the results of an exam.
<b>Inputs</b>	Exam identifier
<b>Source</b>	Faculty member selects an exam from display, Online Exam Board database.
<b>Outputs</b>	All results associated with that exam like a list of Username, student ID, first name, last name, test result and test statistics for the number of pass, fail, and no-shows.
<b>Destination</b>	Output displayed on screen.
<b>Requires</b>	At least one exam to have been created in the system.
<b>Pre-Condition</b>	A list of exams available to view is displayed on screen.
<b>Post-Condition</b>	No changes are made to the exam.
<b>Side-Effects</b>	None

#### 3.2.1.6. Publish Exam Results

<b>Function</b>	Publish Exam Results
<b>Description</b>	Shall allow a Faculty member to publish the results of an exam for Students to view results.
<b>Inputs</b>	Exam identifier
<b>Source</b>	Faculty member selects an exam from a list that is displayed.
<b>Outputs</b>	None
<b>Destination</b>	Online Exam Board database.
<b>Requires</b>	At least one exam to have been created in the system, and not yet published, that has scores entered.

<b>Pre-Condition</b>	A list of exams displayed on the Faculty member's screen.
<b>Post-Condition</b>	Exam status changed to published.
<b>Side-Effects</b>	Test results viewable in Student display.

#### **3.2.1.7. Student Record View All**

<b>Function</b>	View All
<b>Description</b>	Shall allow a Faculty member to view all Student records.
<b>Inputs</b>	Exam identifier
<b>Source</b>	The Online Exam Board database.
<b>Outputs</b>	Display Student ID, username, last name, first name, major, email, exam history, and student's result of programming, communication, and core exams.
<b>Destination</b>	Display output to screen.
<b>Requires</b>	At least one student has been created in the system.
<b>Pre-Condition</b>	View All option is displayed.
<b>Post-Condition</b>	Faculty member's screen displays the list Student records.
<b>Side-Effects</b>	None

#### **3.2.1.8. Student Record Add New**

<b>Function</b>	Add New
<b>Description</b>	Shall allow a Faculty member to add new Student record in the system.
<b>Inputs</b>	Student ID, username, last name, first name, major, email, local phone number, local address, student's result of programming, communication, and core exams.
<b>Source</b>	Input from Faculty member.
<b>Outputs</b>	A new student added into the system.
<b>Destination</b>	Online Exam Board database

<b>Requires</b>	Student record does not exist in system already.
<b>Pre-Condition</b>	Faculty member's screen displays fields to enter input.
<b>Post-Condition</b>	Faculty member's screen confirms Student record added.
<b>Side-Effects</b>	None

### 3.2.1.9. Student Record Search

<b>Function</b>	Search
<b>Description</b>	Shall allow a Faculty member to search a Student record in the system.
<b>Inputs</b>	The system shall require at least one of the following inputs: Student ID, username, last name, first name, major, email, programming exam, communication exam, and each core exam.
<b>Source</b>	Input from Faculty member, Online Exam Board database records.
<b>Outputs</b>	A Student record.
<b>Destination</b>	Display output to screen
<b>Requires</b>	At least one Student record matching the search criteria exists.
<b>Pre-Condition</b>	Display search fields to enter input.
<b>Post-Condition</b>	Faculty member's screen displays search results.
<b>Side-Effects</b>	None

### 3.2.1.10. Student Record Edit

<b>Function</b>	Edit Record
<b>Description</b>	Shall allow a Faculty member to edit a Student record in the system.
<b>Inputs</b>	Student ID or username, record to edit.
<b>Source</b>	Txstateid from user and record from Online Exam Board database.

<b>Outputs</b>	None
<b>Destination</b>	Online Exam Board database
<b>Requires</b>	Student exists in the system and valid edit input.
<b>Pre-Condition</b>	Faculty member's screen displays Student record edit input fields.
<b>Post-Condition</b>	Student record is updated.
<b>Side-Effects</b>	Updated student details reflected wherever the student record is displayed.

#### **3.2.1.11. Student Record Change Exam Result**

<b>Function</b>	Change Exam Result
<b>Description</b>	Shall allow a Faculty member to change an exam result of a Student record in the system.
<b>Inputs</b>	Student ID or username and record to edit
<b>Source</b>	Input from user and record from Online Exam Board database.
<b>Outputs</b>	None
<b>Destination</b>	Online Exam Board database
<b>Requires</b>	Student exists in the system and valid edit input.
<b>Pre-Condition</b>	Faculty member's screen displays the change exam result field.
<b>Post-Condition</b>	Student record is updated.
<b>Side-Effects</b>	Updated result is reflected to the student.

#### **3.2.1.12. Student Record View Completed**

<b>Function</b>	View Completed
<b>Description</b>	Shall allow a Faculty member to view the Students who have passed all three exams.



<b>Inputs</b>	None
<b>Source</b>	Online Exam Board database
<b>Outputs</b>	Student ID, username, first name, last name, major, email, results of programming, communication, and the core course.
<b>Destination</b>	Results displayed to user screen.
<b>Requires</b>	At least one student has passed the programming, communication, and core exam.
<b>Pre-Condition</b>	Select View is displayed for Faculty member.
<b>Post-Condition</b>	The resulting table of Students is displayed for Faculty member.
<b>Side-Effects</b>	None

### 3.2.2. Student Functions

#### 3.2.2.1. Student Login

<b>Function</b>	Student Login
<b>Description</b>	Shall log a student into the system. A student logs into the system using username and password.
<b>Inputs</b>	Student username and password
<b>Source</b>	Student username and password are entered by the Student.
<b>Outputs</b>	Login-state of the Student.
<b>Destination</b>	Student dashboard. Once login-state of the Student is set, they are redirected to Student dashboard.
<b>Requires</b>	Username and password match a Student user in the system database.
<b>Pre-Condition</b>	The Student is not already logged-in. The login-page is displayed. Student enters the correct username and password.
<b>Post-Condition</b>	The system shall save the login-state of the Student. The

Student interface is displayed.

**Side-Effects**      None

#### **3.2.2.2. Register Exam**

**Function**              Register Exam

**Description**          Student shall register for an existing exam.

**Inputs**                  Username, txstateid, last name, first name, major, email, local phone, local address, local city, local state, local zip code.

**Source**                  Inputs are entered by the Student.

**Outputs**                None

**Destination**          Online Exam Board database

**Requires**                Valid inputs: the system shall check for valid input.

**Pre-Condition**          Register Exam option is displayed for the Student.

**Post-Condition**        The student must be registered for the exam.

**Side-Effects**          Registered Student details will display for the Faculty in View Registered (see section 3.2.1.3).

#### **3.2.2.3. Withdraw Exam**

**Function**                Withdraw Exam

**Description**          Student shall withdraw from a registered exam.

**Inputs**                  Username and exam identifier.

**Source**                  Student enters username and selects exam identifier.

**Outputs**                None

**Destination**          Online Exam Board database

**Requires**                The student must have already registered for the exam.

**Pre-Condition**          Student user has selected “withdraw exam” option in their interface.

<b>Post-Condition</b>	The student must be withdrawn from the exam.
<b>Side-Effects</b>	Withdrawn student details must not display to the faculty in View registered view.

#### **3.2.2.4. View Exam Results**

<b>Function</b>	View Exam Results
<b>Description</b>	Student shall view results for exams that have been published.
<b>Inputs</b>	None
<b>Source</b>	Online Exam Board database.
<b>Outputs</b>	A list of all exam results for the Student
<b>Destination</b>	Results displayed to Student's screen.
<b>Requires</b>	At least one exam result must be published for the student.
<b>Pre-Condition</b>	Student has selected the View Exam Result option in the display.
<b>Post-Condition</b>	No changes made to exam.
<b>Side-Effects</b>	None

### **3.3. Performance Requirements**

The performance requirements are as follows:

- System login/logout shall take less than 5 seconds.
- Creation and update on exam and student record interface should be within 10 seconds.
- System shall support 100 simultaneous users.

### **3.4. Design Constraints**

Online Exam Board shall conform to the following design constraints:

- System logs out user after a 30 minute inactivity period.
- Limited to HTTP/HTTPS.

### **3.5. Software System Attributes**

#### **3.5.1. Availability**

Online Exam Board shall be available to users 24 hours a day, 7 days a week, with the exception of being down for maintenance. If the system crashes, it should be back up within two hours.

#### **3.5.2. Security**

Students will be able to access only their own personal information and not that of other students. Only Faculty can create exams and change exam results.

#### **3.5.3. Maintainability**

Any updates or troubleshooting shall be allowed on server-side computers only without any patches required by the user.