Software Requirements Specification

for

GooGrade

Version 3.8 approved

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BluGoo

03-13-09

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Revision History

Name	Date	Reason For Changes	Version
Paul Phu	01-29-09	First Draft	1.0
Hermyn Mendez	02-02-09	First Major Revision (edited section 1,2, added 3)	2.0
Hermyn Mendez	02-05-09	Added/Revised Section 4 and Appendix C (Kathy, Paul, and Kalvin). Revised sections utilizing the QA document. Synced Section 3 with Use Case List.	2.1
Paul Phu	2-10-09	Edits to all sections excluding section 3	2.2
Paul Phu	2-11-09	Add customer input on changes to all sections excluding section 3	2.3
Paul Phu	2-11-09	Revised Appendix and fixed small errors.	2.4
Hermyn Mendez	2-11-09	Updated section 3	2.5
Katherine Blizard	2-16-09	Fixed small errors. References, Glossary and Data Dictionary	2.7
Hermyn Mendez	2-17-09	Class to Course and Page to Display	2.8
Hermyn Mendez	2-17-09	Revised Section 3, mostly worked on Functional Requirements and formatting. Pasted in Data Dictionary and tried to bold Data Dictionary terms.	2.9
Paul Phu	2-25-09	Revised all Sections excluding section 4. Added revised Data Dictionary and Glossary. Added Survey.	2.9.1
Hermyn Mendez	2-25-09	Updated Section 3 by working on formatting, took out Data Dictionary redundancies, and reworded most the features and functional requirements. Included previously TBD features.	3.0
Paul Phu	3-3-09	Fixed minor errors	3.0.1
Hermyn Mendez	3-6-09	Fixed some of the comments made on peer review (sections 1, 2, 3). Completely rewrote section 3 to match the new screenshots in Appendix C.	3.5
Paul Phu	3-7-09	Fixed minor errors	3.5.1
Katherine Blizard	3-10-09	Content revision: Section 3-3.6, Glossary, Data Dictionary. Document merge.	3.6.0
Michael Quan	3-10-09	Content revision: Section 1-2, 3.7-3.10	3.6.1
Kalvin Vu	3-10-09	Content revision: Section 3.11-5	3.6.2
Katherine Blizard	3-12-09	Quality Assurance.	3.6.5
Michael Quan	03-13-09	Quality Assurance	3.7
Katherine Blizard	3-16-09	Added 3.5.4 example. Changed Data Dictionary. Final Spelling check	3.8

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1. Introduction

1.1 Purpose

This SRS document provides specifications for the complete development of the GooGrade v1.0 grader tool. This document states the functionality of GooGrade v1.0. Features for future releases are noted accordingly. All GooGrade v1.0 features have a higher priority than those features noted for follow-up releases. Items in the Data Dictionary will be indicated in bold font for clarity and aid in development. This document is intended for members of the GooGrade development team, the BluGoo team, the customer Lauren Tsung, and the user. The SRS document contains features and information required for the release of GooGrade v1.0 and possible future releases. It should be read through thoroughly, though the table of contents may be used for immediate references. Sections 1 to 2.2 give a quick overview of GooGrade while the rest of this document will give more specification details.

1.2 Project Scope

GooGrade is an open source web based application designed to help teachers track and manage students and their respective grades in a course. It is also designed to allow students to track their grades and compare their progress to the rest of the peers in their course by means of grade metrics. Because GooGrade is open source, it complies with the Open Standard Requirements (OSR) for Software. The OSR states that the GooGrade must be freely available and royalty-free. GooGrade must not have any dependencies on technology that does not comply with the OSR.

For more information regarding the Business Requirements, see section 1 of the GooGrade Vision and Scope.

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1.3 References

REF-1: Open Standard Requirements for Software http://opensource.org/osr

REF-2: BluGoo Wiki http://wiki.csc.calpoly.edu/BluGoo

REF-3: Schalch, Stephen R. *Object Oriented Classical Software Engineering*

REF-4: BluGoo, Vision and Scope Document.

REF-5: BluGoo, Use Case Document.

REF-6: Wieger's SRS Example
http://www.csc.calpoly.edu/%7Ecsturner/courses/308w09/srs_template.doc

REF-7: Web Content Accessibility Guidelines (WCAG) 2.0
http://www.w3.org/TR/WCAG20/

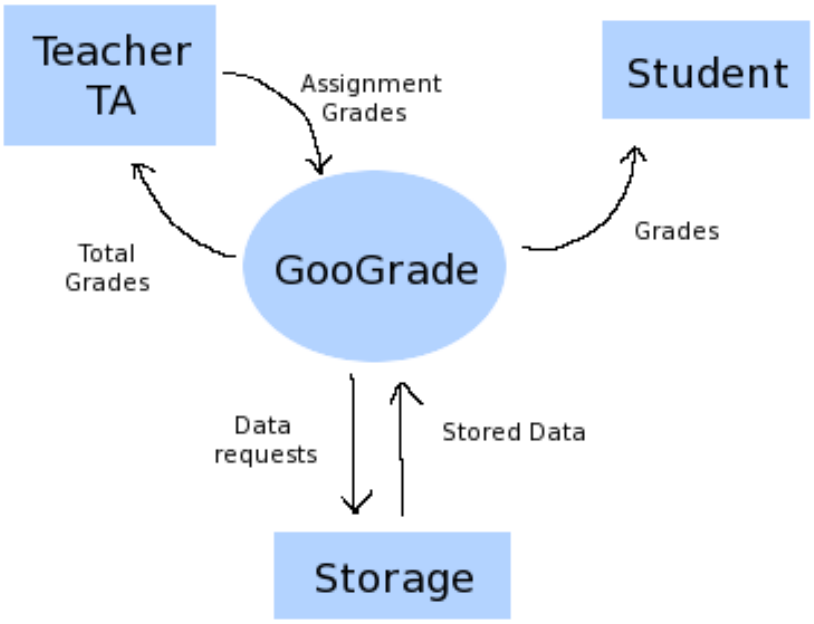
REF-8: *Family Educational Rights and Privacy Act* (FERPA).
http://www.ed.gov/policy/gen/guid/fpco/ferpa/index.html.

REF-9: : Nielsen, Jakob. *Visualizing Links*. http://www.useit.com/alertbox/20040510.html

2. Overall Description

2.1 Product Perspective

GooGrade's conception is a response to many already available grading tools which do not effectively package commonly desired student/teacher functionality. Popular grading tools, such as Blackboard, are expensive and do not offer all of the features that GooGrade provides (see Appendix A in Vision and Scope document). GooGrade not only provides a means of editing and tracking grades and progress, it also provides an environment for teachers and students to exchange electronic documents. Most students turn in their assignments to teachers via physical copies. To bring the submission process to the digital world, Cal Poly's Computer Science Department created a UNIX based program called *handin* to allow students to submit electronic copies of their assignments. Though the process is functional, it can be difficult to use because it requires experience in UNIX. GooGrade offers a web based interface which not only allows students to submit their assignments to teachers, but also allows teachers to upload documents for students to download. For these reasons, we believe GooGrade could replace programs like *handin*.



Context Diagram for GooGrade

2.2 Product Features

GooGrade allows **Students** and **Teachers** access to a common grading application. **Teachers** are able to take attendance, add users, manage **Assignment Grades**, post **Announcements** and, in release 2, upload **Files** for **Students** to download. **Students** are able to view their grades, view assignment metrics, upload A**ssignments** for submission, and are able to project their final grade with the grade predictor.

2.3 User Types and Characteristics

Teacher	The **Teacher** is the admin for up to five **Courses**. They manage **Students**, their respective grades, **Teacher Assistants** (see below), **Assignments**, and they also have the ability to post **Announcements** and upload documents for the **Students**.
Teacher Assistant	The **Teacher Assistant** is a lower admin. They are managed and given permissions by the **Teacher**. If the **Teacher** desires, the **Teacher Assistant** may have all of the functionality that a **Teacher** has.
Student	The **Students** are able to view their grades and any **Announcements** posted by the **Teacher** and **Teacher Assistant** for a given **Course**. They are also given access to **Assignment Metrics** and also have the ability to upload **Assignments** for submission.

2.4 Operating Environment

OE-1: GooGrade will support the following web browsers: Firefox 3, Safari 3, and Internet Explorer 7.

OE-2: GooGrade has the ability to run on Linux servers.

OE-3: Access to GooGrade is available anywhere there is Internet access.

2.5 Design and Implementation Constraints

CO-1: GooGrade will be web based.

CO-2: All HTML shall meet the W3C XHTML 1.1 Standard.*

CO-3: All CSS shall meet the W3C CSS level 2.1 Standard* to support a similar look.

CO-4: GooGrade must have the same functionality across all supported web browsers (see OE-1).**

CO-5 GooGrade will not display any information to an unauthorized User.***

*As recommended by the Customer
**As recommended by W3C
***As enforced by law by FERPA

2.6 User Documentation

Instructions on how to use GooGrade shall be provided online on our website (see section 1.3) and included with GooGrade.

2.7 Assumptions and Dependencies

Assumptions:

AS-1 The storage space of user information and grades will be accessible to users at all times regardless of high volume loads trying to access the grading application simultaneously.

AS-2 **Course** prerequisites are met by enrolled **Student**(s).

AS-3 All **Student**(s) are enrolled in the **Course**.

AS-4 All changes made to the storage space of user information and grades of the grading application take effect immediately.

Dependencies:

DE-1 The system will need to be hosted at an address on the Internet with encryption.

DE-2 The system depends on the **Teacher** and **Teacher Assistant** keeping **Course** rosters and any **Assignment** accurate and up to date.

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3. System Features

3.0 Conventions

Text in bold are items in the Data Dictionary, Appendix B. Items in the Glossary, Appendix A, will not be indicated in bold.

If a requirement has a storyboard in Appendix C associated with it, the requirement description will specify the location of the storyboard.

Only the first instance of redundant functional requirements shall be described. Later instances will be listed last of the requirements under Other Applicable Requirements, with a reference to where the first instance appeared.

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User (Role)	Section	Feature Name	Brief Description
Student	**3.1**	**View Course**	Allows the **Student** to view the **Course** information.
	3.2	**View Announcements**	Allows the **Student** to view the **Course Announcements**.
	3.3	**View Grades**	Allows the **Student** to view their grades.
	3.4	**View Assignments**	Allows the **Student** to access **Files** and descriptions for each **Assignment**.
	3.5	**Grade Predictor**	Calculates, for the student, what **Assignment Scores** they need to earn a desired grade.
Teacher and Teacher Assistant	**3.6**	**Manage Courses**	Allows the admin to add, edit, and remove **Courses**.
	3.7	**Manage Announcements**	Allows the admin to add, edit, and remove **Announcements**.
	3.8	**Manage Grades**	Allows the admin to add, edit, and remove **Student Assignment Scores**.
	3.9	**Manage Assignments**	Allows the admin to add, edit, and remove **Assignments**.
	3.10	**Manage Accounts**	Allows the admin to add, edit, and remove **Accounts**
	3.11	**Send Email**	Allows the admin to send emails to either individuals or the entire **Course**.
	3.12	**Take Attendance**	Allows the admin to take attendance for the **Course**.
	3.13	**View Roster**	Displays, for the admin, a list of everyone enrolled in the **Course**.
	3.14	**Adjust Grading Curve**	Allows the admin to adjust the grading curve for the **Course**.
All	**3.15**	**Edit My Account**	Allows all users to edit their **Email Address** and **Password**. Only the **Teacher** may adjust their **Username**.
	3.16	**Printer Friendly Display**	Displays a "printer friendly" version of the current display.
	3.17	**Reset Password**	Randomly generates a new **Password** and sends it to the user **Email Address**.

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3.1 View Course

3.1.1 Description and Priority

Description	The system displays the **Course** attributes. These include all attributes in the **Course.**
Priority	Low

3.1.2 Stimulus/Response Sequences

Stimulus	User selects “View Course”
Response	System takes user to the “View Course” display.

3.1.3 Functional Requirements

REQ-1.1: When user selects “View Course,” the system displays the **Course** data items in a table. These include all attributes in the **Course.**

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3.2 View Announcements

3.2.1 Description and Priority

Description	The system displays a list of the 20 most recent **Announcement**(s) posted by the **Teacher. (**See storyboard in Appendix C, C-2)
Priority	High

3.2.2 Stimulus/Response Sequences

Stimulus	User selects "View Announcements"
Response	System takes user to the "View Announcements" display

Stimulus	User selects a collapsed **Announcement.**
Response	System expands **Announcement** such that the **Announcement Text** is visible under the **Announcement Date** and **Announcement Title**.

Stimulus	User selects a page number.
Response	System displays the announcements contained on that page number.

Stimulus	User selects PREV or NEXT
Response	System takes the user to either the previous or next page, respectively.

3.2.3 Functional Requirements

REQ-2.1: The system shall display a list of the 20 most recent **Announcement**(s) posted by the **Teacher,** sorted with the most recently posted **Announcement** at the top of the list.

REQ-2.2: If no **Announcement** has been made the system shall display a "No Announcements Exist."

REQ-2.3: By default, when a page is being viewed, only the **Announcement** at the top of the list shall be expanded to show the **Announcement Text**. The rest are to be collapsed to their **Announcement Titles**.

REQ-2.4: If the user is currently viewing "page 1" the "PREV" link shall be disabled.

REQ-2.5: If the user is currently viewing the last page, the "NEXT" link shall be disabled.

REQ-2.6: If there are more than 20 **Announcements**, the system shall create more pages to accommodate the additional **Announcements**. Subsequent pages are created such that each page only contains at most 20 **Announcements.** "Page 1" will contain the 20 most recent **Announcements** and subsequent pages will contain up to 20 preceding ones.

REQ-2.7: The system displays only 5 page links at one time. Initially only the first 5 are displayed. If the user moves to page 5, the system will display page links 2-6. Beyond that, if the user moves to page "n," the system will display page links "n-3" to "n+1". If page "n" is the last page, then page links "n-4" to "n" are displayed instead.

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3.3 View Grades

3.3.1 Description and Priority

Description	The system displays a table containing the **Student's Assignment Grades** in chronological order and their **Total Grade**. (see storyboard in Appendix C, C-4)
Priority	High

3.3.2 Stimulus/Response Sequences

Stimulus	User selects "View Grade"
Response	System takes user to the "View Grade" display.

Stimulus	User selects a column on the table displayed
Response	System sorts the table with respect to the column selected.

3.3.3 Functional Requirements

REQ-3.1: The system shall display a table containing the **Student's Assignment Grades and Assignment Metrics** in chronological order.

REQ-3.2: The system shall display a **Course** grade distribution bar graph and the **Student's** current grade in the **Course**.

REQ-3.3: If the user selects a column header, the system shall sort the table with respect to that column. If the column contains numbers, it will be sorted in ascending numerical order (highest on top). Otherwise, it will be sorted in descending alphabetical order (A/a on top).

REQ-3.4: **Total Grade** shall always be kept at the bottom of the table (design choice by BluGoo).

REQ-3.5: If an **Assignment** has no **Assignment Score**, the system shall display the **Assignment** name with the **Assignment Score** field blank.

REQ-3.6: If an **Assignment** has no **Assignment Metrics**, the system displays the **Assignment Metrics** fields blank.

REQ-3.7: If no **Assignments** exist yet, the system shall display the words "No Assignments Exist."

REQ-3.8: The bar in the graph in which the **Student's** current grade or **Assignment** grade lies in shall be colored differently than the rest.

REQ-3.9: If the user selects an **Assignment Name** from the table, the **Course** distribution graph will change to a distribution graph for the **Assignment**, and the display will move to the top to put the graph in view. It will display a distribution of letter grades for the **Assignment** and the caption below the graph will change to "[**Assignment Name**] Grade Distribution."

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3.4 View Assignments

3.4.1 Description and Priority

Description	The system displays a table containing the **Course's Assignments** in chronological order. (see Storyboard Appendix C, C-3)
Priority	Medium Low

3.4.2 Stimulus/Response Sequences

Stimulus	User selects "View Assignments"
Response	System takes user to the "View Assignments" display.

Stimulus	User selects an **Assignment Name**.
Response	System displays the **Assignment Description**.

Stimulus	User selects "Download."
Response	System prompts the user for a location to save the file for the **Assignment**.

Stimulus	User selects "Upload."
Response	System prompts the user for a location of the file being submitted for that **Assignment**.

3.4.3 Functional Requirements

REQ-4.1: When user selects "View Assignments," the system shall display a table containing the **Course's Assignments** in chronological order with the most recently posted **Assignment** at the bottom of the table.

REQ-4.2: When user selects an **Assignment Name**, the system opens a new display which contains the **Assignment Description**.

REQ-4.3: If there are **Files** for the **Assignment**, the system shall display a "Download" link for that **Assignment**.

REQ-4.4: When user selects "Upload," the system shall prompt the user for the location of the file to be submitted for that **Assignment**.

REQ-4.5: When user selects "Download," the system shall prompt the user for a location to save the **Files** for the **Assignment**.

REQ-4.6: The system shall display the total of the **Assignment Totals** at the bottom of the table.

Other Applicable Requirements: REQ-3.6

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3.5 Predict Grade

3.5.1 Description and Priority

Description	The system shall display the **Total Grades** possible to obtain for a particular **Student**, excluding F. (see Storyboard Appendix C, C-5).
Priority	Medium Low

3.5.2 Stimulus/Response Sequences

Stimulus	User selects "Grade Predictor"
Response	System takes user to the "Grade Predictor" display. This display contains a selection of desired grades

Stimulus	User selects a desired grade
Response	System displays the needed **Assignment Scores** for **Assignments** to get a desired **Total Grade**.

3.5.3 Functional Requirements

REQ-5.1: When user selects "Grade Predictor," the system shall display grades possible to obtain, excluding F, the **Student's** current grade, and two tables; one which contains **Assignments** with graded **Assignment Scores** and one which contains ungraded **Assignments.**

REQ-5.2: When user selects a desired grade, the system shall determine one possible set of **Assignment Scores** that would earn the **Student** the desired grade.

REQ-5.3: If there are no more **Assignments** without **Assignment Scores**, the system shall display the student's final grade and "No More Ungraded Assignments."

REQ-5.4: If no **Assignments** have **Assignment Scores**, the system shall display "No Graded Assignments Exist."

REQ-5.5: If the desired **Total Grade** is no longer possible based upon the algorithm described in section 3.5.4, the system shall display "Grade Not Possible."

Other Applicable Requirements: REQ-3.6

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3.5.4 Grade Predictor Algorithm

The Lowest Points Possible to obtain a specific **Total Grade** is derived from the multiplication of the sum of all **Assignment Total**(s) and the percentage of the desired grade's **Course Curve**.

Subtract the current points held by the **Student** from the lowest points possible to get the Points Needed to achieve the desired grade.

For each ungraded **Assignment,** subtract one from the Points Needed field. Add the subtracted point to the ungraded **Assignment** if the ungraded **Assignment** does not already have points equal to its **Assignment Total**. Repeat for all **Assignments**, reiterating through the loop again if the list of **Assignments** is exhausted, until Points Needed is zero.

If every ungraded **Assignment** is assigned a value equal to their **Assignment Total** before Points Needed is exhausted, the desired grade is unobtainable.

In the end will be an accumulation of points in each ungraded **Assignment** representing the minimum score needed on that assignment.

Example:
Suppose Cthulhu needs only one point overall to get an A (he doesn't know this yet). All that's left for him to do is finish a 10 point final to become President of the United States.

The field in the ungraded **Assignment** begins at zero, and a point subtracted from Points Needed would be added to the ungraded **Assignment**. Cthulhu's one point is then added to the final. The final has a value of 1.

Therefore, Cthulhu would need to get one point on the Final, which matches the Points Needed prediction.

If Cthulhu needed two points to get an overall A, and he had one 10 point final and one 5 point homework A**ssignment** left, the algorithm would place one point in the final and one point in the assignment and tell Cthulhu that is what he needed. Adding the points attributed in the ungraded A**ssignments** should add back up to the Points Needed (in the second case, 1 in final + 1 in the homework = 2 total) , confirming that the scores are indeed the minimum for each A**ssignment** to get the desired grade.

Cthulhu would be pleased as he put in so much hard work earlier intimidating everybody to get good marks throughout the year. Naturally, he shouldn't need to work too hard to finish the class.

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3.6 Manage Courses

3.6.1 Description and Priority

Description	The system allows a user to add, edit, remove, import and export **Courses**.
Priority	Low

3.6.2 Stimulus/Response Sequences

Stimulus	User is logged in the system.
Response	System displays a selection of icons to add, edit, remove, import and export **Courses**.

Stimulus	User selects to edit a **Course.**
Response	System displays the **Course** and the data items it editable fields.

Stimulus	User edits the **Course** and selects “Accept”
Response	System returns to the display from which the edit **Course** was selected.

Stimulus	User selects to remove a **Course.**
Response	System prompts the user to confirm removal

Stimulus	User selects “Remove”
Response	System returns to the display from which the remove **Course** was selected.

Stimulus	User selects to add a **Course.**
Response	System displays **Course** data items it editable fields.

Stimulus	User enters the **Course** data items and selects “Accept”
Response	System returns to the display from which the add **Course** was selected.

Stimulus	User selects to import a **Course.**
Response	System prompts user for a file containing a **Course**.

Stimulus	User selects the location of the **File** and selects “Accept”
Response	System returns to the display from which the import **Course** was selected.

Stimulus	User selects to export a **Course.**
Response	System prompts user to enter a location to save the **File**.

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Stimulus	User selects a location for **File** and selects "Accept"
Response	System returns to the display from which the export **Course** was selected.

3.6.3 Functional Requirements

REQ-6.1: The system shall display a selection of icons, at all times, which allow the user to add, edit, remove, import and export a **Course**.

REQ-6.2: When user selects to edit a **Course**, the system shall display the data items in editable data fields. If the user selects "Accept," the system will save the **Course** and system returns to the original display.

REQ-6.3: When user selects to remove a **Course**, the system shall prompt the user to confirm the removal. If the user selects "Remove," the system shall return to the display from which the remove **Course** was selected.

REQ-6.4: When user selects to add a **Course**, the system shall display the data items in editable data fields. If the user selects "Accept," the system shall save the **Course** and system returns to the original display.

REQ-6.5: When user selects to import a **Course**, the system prompts the user for a **File** containing a **Course**. Once the user has entered the **File**, the system will save the **Course** and system returns to the display from which the add **Course** was selected.

REQ-6.6: When user selects to export a **Course**, the system shall prompt the user for a location to save a **File** containing the **Course**. Once the user has entered the location, the system shall return to the display from which the add **Course** was selected.

REQ-6.7: If user selects "Accept" while adding, importing, or editing a **Course** and all of the **Course** has not been entered, the system shall display "The Following information is Missing: "and indicates all empty fields.

REQ-6.8: If user selects "Accept" while adding, importing, or editing a **Course** and the **Course Title**, **Course Section**, or **Course Number** already exist, the system shall display "Course Already Exists: " and then display the existing **Course**.

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3.7 Manage Announcements

3.7.1 Description and Priority

Description	The system shall display "View Announcements" (see section 3.2) with added management features (See storyboards in Appendix C, C-9 through C-12).
Priority	High

3.7.2 Stimulus/Response Sequences

Stimulus	User selects "Manage Announcements"
Response	System takes user to the "View Announcements" display with added features (see description)

Stimulus	User selects to edit an **Announcement.**
Response	System displays the **Announcement** and the data items it editable fields.

Stimulus	User edits the **Announcement** and selects "Accept"
Response	System saves the **Announcement** and returns to "Manage Announcements."

Stimulus	User selects to remove an **Announcement.**
Response	System prompts the user to confirm removal

Stimulus	User selects "Remove"
Response	System removes the **Announcement** and returns to "Manage Announcements."

Stimulus	User selects to add an **Announcement.**
Response	System displays **Announcement** data items it editable fields.

Stimulus	User enters the **Announcement** data items and selects "Accept"
Response	System saves the **Announcement** and returns to "Manage Announcements."

3.7.3 Functional Requirements

REQ-7.1: When user selects "Manage Announcements," system shall display "View Announcements" with added management features. These features shall include add, edit, and remove **Announcements**.

REQ-7.2: When user selects to edit an **Announcement**, the system shall display the data items in editable data fields. If the user selects "Accept," the system shall save the **Announcement** and return to the "Manage Announcements" display.

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REQ-7.3: When user selects to remove an **Announcement**, the system shall prompt the user to confirm the removal. If the user selects "Remove," the system shall remove the **Announcement** and return to the "Manage Announcements" display.

REQ-7.4: When user selects to add an **Announcement**, the system shall display the data items in editable data fields. If the user selects "Accept," the system shall save the **Announcement** and return to the "Manage Announcements" display.

REQ-7.5: If user selects "Accept" while adding, importing, or editing an **Announcement** and all of the **Announcement** has not been entered, the system shall display "The Following information is Missing: " and list the fields that are empty.

Other Applicable Requirements: REQ-2.2, REQ-2.3, REQ-2.4, REQ-2.5, REQ-2.6

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3.8 Manage Grades

3.8.1 Description and Priority

Description	The system shall display a table of editable fields corresponding to **Students' Assignment Scores**. (See storyboard in Appendix C, C-17)
Priority	High

3.8.2 Stimulus/Response Sequences

Stimulus	User selects "Manage Grades"
Response	System displays the "Manage Grades" display.

Stimulus	User enters **Assignment Scores** into the table and selects "Save."
Response	System saves the **Assignment Scores** and returns to "Manage Grades"

3.8.3 Functional Requirements

REQ-8.1: The system shall display a table of fields (a grid) with the **Course's Students** on the right and the **Course's Assignments** on the top. The fields shall be editable, though the user must select "Save" to save the changes. Above the table shall be the **Course** grade distribution graph (identical to the graph in "View Grades").

REQ-8.2: If no **Assignments** exist, the system shall display "No Assignments Exist" and a link to add **Assignment**.

REQ-8.3: If no **Students** exist, the system shall display "No Students Exist" and a link to add **Student**.

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3.9 Manage Assignments

3.9.1 Description and Priority

Description	The system shall display "View Assignments" (see section 3.4) with added management features. (See storyboards in Appendix C, C-13 through C-16).
Priority	High

3.9.2 Stimulus/Response Sequences

Stimulus	User selects "Manage Assignments"
Response	System takes user to the "View Assignments" display with added features (see description)

Stimulus	User selects to edit an **Assignment.**
Response	System displays the **Assignment** and the data items it editable fields.

Stimulus	User edits the **Assignment** and selects "Accept"
Response	System saves the **Assignment** and returns to "Manage Assignments."

Stimulus	User selects to remove an **Assignment.**
Response	System prompts the user to confirm removal (see Appendix C, C-10)

Stimulus	User selects "Remove"
Response	System removes the **Assignment** and returns to "Manage Assignments."

Stimulus	User selects to add an **Assignment.**
Response	System displays **Assignment** data items it editable fields.

Stimulus	User enters the **Assignment** data items and selects "Accept"
Response	System saves the **Assignment** and returns to "Manage Assignments."

Stimulus	User selects to import an **Assignment.**
Response	System prompts the user for the location of a **File** that contains an **Assignment**

Stimulus	User enters the location of the file.
Response	System saves the **Assignment** and returns to "Manage Assignments."

Stimulus	User selects to "Upload"
Response	System prompts the user for the location of a **File** for the **Assignment**

Stimulus	User selects to "Download Assignment Files"
Response	System prompts the user for the location to save the **Assignment Files.**

Stimulus	User selects to "Download Student Files"

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Response	System prompts the user for the location to save the **Files** submitted by **Students** for the **Assignments**.

3.9.3 Functional Requirements

REQ-9.1: When user selects "Manage Assignments," system shall display "View Assignments" with added management features. These features include add, import, edit, and remove **Assignments**.

REQ-9.2: When user selects to edit an **Assignment**, the system shall display the data items in editable data fields. If the user selects "Accept," the system shall save the **Assignment** and return to the "Manage Assignments" display.

REQ-9.3: When user selects to remove an **Assignment**, the system shall prompt the user to confirm the removal. If the user selects "Remove," the system shall remove the **Assignment** and return to the "Manage Assignments" display.

REQ-9.4: When user selects to add an **Assignment**, the system shall display the data items in editable data fields. If the user selects "Accept," the system shall save the **Assignment** and return to the "Manage Assignments" display.

REQ-9.5: When user selects to import an **Assignment**, the system shall prompt the user to select a **File**. When the user selects a **File** containing an **Assignment**, the system shall save the **Assignment** and return to the "Manage Assignments" display.

REQ-9.6: When user selects to "Upload," the system shall prompt the user for the location of a **File** for the **Assignment**. When the user enters the location, the **File** shall be saved and the system shall return to "Manage Assignments."

REQ-9.7: When user selects to "Download Assignment Files," the system shall prompt the user for the location to save the **Files** for the **Assignment**.

REQ-9.8: When user selects to "Download Student Files," the system shall prompt the user for the location to save the **Files** by the **Students** for the **Assignment**.

REQ-9.9: If user selects "Accept" while adding, importing, or editing an **Assignment** and all of the **Assignment** has not been entered, the system shall display "The Following information is Missing: "and list the fields that are empty.

REQ-9.10: If user selects "Accept" while adding or importing, a **Assignment** and the **Assignment Title**, **Assignment Section**, or **Assignment Number** already exist, the system shall display "**Assignment** Already Exists: " and displays the existing **Assignment**.

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REQ-9.11: The “Download Assignment Files” shall be displayed when there are **Files** for that **Assignment.**

REQ-9.12: The “Download Student Files” shall be displayed when there are **Files** submitted by the **Students** for that **Assignment.**

Other Applicable Requirements: REQ3.6, REQ-4.2, REQ-4.6

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3.10 Manage Accounts

3.10.1 Description and Priority

Description	The system shall display table of **Students** and **Teacher Assistants** in the **Course**, and their data items (including what **Courses** they are in). The user may add, import, edit, and remove **Accounts**. (see Appendix C, C-18 through C-20)
Priority	High

3.10.2 Stimulus/Response Sequences

Stimulus	User selects "Manage Accounts"
Response	System takes user to the "Manage Accounts" display

Stimulus	User selects to edit an **Account.**
Response	System displays the **Account** and the data items it editable fields.

Stimulus	User edits the **Account** and selects "Accept"
Response	System saves the **Account** and returns to "Manage Accounts."

Stimulus	User selects to remove an **Account.**
Response	System prompts the user to confirm removal

Stimulus	User selects "Remove"
Response	System removes the **Account** and returns to "Manage Accounts."

Stimulus	User selects to add an **Account.**
Response	System displays **Account** data items it editable fields.

Stimulus	User enters the **Account** data items and selects "Accept"
Response	System saves the **Account** and returns to "Manage Accounts."

Stimulus	User selects to import an **Account.**
Response	System prompts the user for the location of a **File** that contains an **Account.**

Stimulus	User enters the location of the file.
Response	System saves the **Account** and returns to "Manage Accounts."

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3.10.3 Functional Requirements

REQ-10.1: When user selects “Manage Accounts,” system shall display table of **Students** and **Teacher Assistants** in the **Course**, and their data items (including what **Courses** they are in). The user may add, import, edit, and remove **Accounts**.

REQ-10.2: When user selects to edit an **Account**, the system shall display the data items in editable data fields. A list of **Courses** to which the **Account** may be added to by checking the box next to the **Course Name** shall also be displayed. If the **Account** is a **Teacher Aid**, the system shall display a list of **Permissions** which may be edited by checking or un-checking the respective boxes.

REQ-10.3: When user selects to remove an **Account**, the system shall prompt the user to confirm the removal. If the user selects “Remove,” the system shall remove the **Account** and return to the “Manage Accounts” display.

REQ-10.4: When user selects to add an **Account**, the system shall display the data items in editable data fields. If the user selects “Accept,” the system shall save the **Account** and return to the “Manage Accounts” display.

REQ-10.5: When user selects to import an **Account**, the system shall display prompts the user to select a **File**. When the user selects a **File** containing an **Account**, the system shall save the **Account** and return to the “Manage Accounts” display.

REQ-10.6: If user selects “Accept” while adding, importing, or editing an **Account** and all of the **Account** has not been entered, the system shall display “The Following information is Missing: “and list the fields that are empty.

REQ-10.7: If user selects “Accept” while adding, importing, or editing an **Account Name, Username,** or **Email** Address already exist, the system shall display “**Account** Already Exists: ” and the existing **Account**.

REQ-10.8: If the user attempts to add a **Teacher Assistant** to a **Course** which already has one, the system shall display “A Teacher Assistant already exists in: “ and the **Course Name.**

REQ-10.9: If the user attempts to add a **Teacher Assistant** or **Student** without assigning then to, at least, one **Course,** the system shall display “The account must be enrolled in, at least, one course.”

REQ-10.10: If no A**ccounts** exist, the system shall display “No Accounts Exist” and provides a link to add an **Account**.

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3.11 Send Email

3.11.1 Description and Priority

Description	The system shall send out an **Email** entered by the user.
Priority	Medium Low

3.11.2 Stimulus/Response Sequences

Stimulus	User selects “Send Email”
Response	System takes user to the “Send Email” display. This prompts the User to information about the **Email** being sent.

Stimulus	User inputs information
Response	System displays confirmation.

3.11.3 Functional Requirements.

REQ-11.1: When user selects “Send Email,” the system displays blank fields which represent a new **Email**.
REQ-11.2: When user selects “Send” and all the information has been entered, the system sends the **Email**.
REQ-11.3: When user selects “Send” and all of the information has not been entered, the system displays “The Following Information is Missing:” and lists the fields that are empty.
REQ-11.4: If the user selects **“**Send” with an invalid **Username, Course Name** or **Email Address**, the system displays “Invalid Recipient(s).”

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3.12 Take Attendance

3.12.1 Description and Priority

Description	The system shall display a table of **Students** and the current week's calendar dates (See storyboard in Appendix C, C-21).
Priority	Medium Low

3.12.2 Stimulus/Response Sequences

Stimulus	User selects "Take Attendance"
Response	System takes user to the "Take Attendance" display. The system displays a table of **Students** and the current week's calendar dates.

Stimulus	User edits the attendance records by checking or un-checking the boxes and selects "Accept."
Response	System saves the attendance records.

Stimulus	User selects to move forward, or backward a calendar week.
Response	System displays the table with the next, or previous week's dates.

3.12.3 Functional Requirements

REQ-12.1: The system shall display an attendance table that is a grid of check-boxes and the user may mark **Students** present by checking the check-boxes.
REQ-12.2: When user selects "NEXT," the system shall change the calendar week and "starting date" to 1 week ahead of the current display.
REQ-12.2: When user selects "PREV," the system shall change the calendar week and "starting date" to 1 week prior of the current display.
REQ-12.3: When user selects "Accept," the system shall store the changes.
REQ-12.4: If no **Students** exist, the system shall display "No Students Exist."

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3.13 View Roster

3.13.1 Description and Priority

Description	The system a list of **Students** who are in the **Course.**
Priority	Medium High

3.13.2 Stimulus/Response Sequences

Stimulus	User selects “View Roster”
Response	**System** displays a **Course** roster.

3.13.3 Functional Requirements

REQ-13.1: When user selects “View Roster,” the system shall display a list of **Students** in the **Course**. This list includes the **Student’s Name, Username, Email, and Courses.**

REQ-13.2: If no **Students** exist, the system shall display “No Students Exist.”

REQ-13.3: View Roster shall not display any user's **Password**.

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3.14 Adjust Grading Curve

3.14.1 Description and Priority

Description	The system displays graphs of grades and a way to modify the grading curve. (see Storyboard in Appendix C, C-22).
Priority	Medium

3.14.2 Stimulus/Response Sequences

Stimulus	User selects “Adjust Grading Curve”
Response	System takes user to the “Adjust Grading Curve” display. System displays the two pie graphs and the **Course** curve adjustment interface.

Stimulus	User edits curve and selects “Save.”
Response	The system saves the grading curve.

3.14.3 Functional Requirements

REQ-14.1: When user selects “Adjust Grading Curve,” the system shall display two pie graphs, side by side, and below them is a box to adjust the grading curve.
REQ-14.2: When user adjusts the lower bounds of a grade by selecting the “+” or “-“ icons, the system shall change the graphs immediately showing this adjustment.
REQ-14.3: If the user selects “Cancel,” the system shall return to the “Adjust Grading Curve” display without saving any current adjustments.
REQ-14.4: If the user selects “Save,” the system shall store the new curve adjustment.
REQ-14.5: If the user sets the lower bound of a grade equal to the lower boundary of the grade below or zero if the grade is F, then the “-“ icon for that grade shall be disabled.
REQ-14.6: If the user sets the lower bound of a grade equal to the lower boundary of the grade above or 100 if the grade is an A, then the “+“ icon for that grade shall be disabled.

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3.15 Edit My Account

3.15.1 Description and Priority

Description	The system displays the user's information and gives the option to edit any of the available fields. (See Appendix C, C-6 and C-7)
Priority	Medium Low

3.15.2 Stimulus/Response Sequences

Stimulus	User selects one of the **Account** fields.
Response	System makes the fields editable (text boxes) and replaces the **Password** field with 3 distinct **Password** fields (old, new, and confirm).

Stimulus	User edits their information and selects "Save"
Response	System saves the new **Account** information.

3.15.3 Functional Requirements

REQ-15.1: When user selects the **Account** fields, the fields shall become editable and "Save" and "Cancel" icons shall appear below these fields.
REQ-15.2: The **Password** field shall be replaced with 3 distinct **Password** fields (old, new, and confirm).
REQ-15.3: Only the **Teacher** shall edit **Username**(s)
REQ-15.4: When user selects "Save," the system shall save the user's **Account** information.
REQ-15.5: If the **Email Address** is already in use, system shall display "**Email Address** Already Exists" and user must correct the error to continue.
REQ-15.6: If the **Email Address** is not valid, the system shall display "The **Email Address** is Invalid."
REQ-15.7: If **Password** does not comply with SE-5 (see Section 5.3 in SRS), the system shall display "The Password is Invalid."
REQ-15.8: If New **Password** field does not match the confirm **Password** field, the system shall display "Password Does Not Match" and asks the user to re-enter the **Password.**
REQ-15.9: If Old **Password** field does not match the user's **Password**, the system shall display, "Old Password is incorrect."

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3.16 Printer Friendly Display

3.16.1 Description and Priority

Description	The system formats the size and color of the current page for printing.
Priority	Low

3.16.2 Stimulus/Response Sequences

Stimulus	User selects “Printer Friendly Display”
Response	System takes user to the “Printer Friendly” version of the display from which the “Printer Friendly Display” feature was selected.

3.16.3 Functional Requirements

REQ-16.1: When user selects “Printer Friendly Display,” the system shall minimize color usage by displaying the feature display in black and white without the left navigation column, and text is formatted to be fit 8.5” x 11” margin. Tables and images shall be scaled to fit the 8.5” x 11 margin”. (Approved by Customer)

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3.17 Reset Password

3.17.1 Description and Priority

Description	The system randomly generates a **Password**, changes the user's **Password** to the newly generated **Password** and sends the **Password** to the user's **Email Address**.
Priority	Medium Low

3.17.2 Stimulus/Response Sequences

Stimulus	User selects "Reset Password"
Response	System takes user to the "Reset Password" display, which displays confirmation and the user's **Email Address**.

3.17.3 Functional Requirements

REQ-17.1: When user selects "Reset **Password**" the system shall send an E**mail** to the user's E**mail** A**ddress** prompting for confirmation to reset **password**.

REQ-17.2: The confirmation E**mail** (REQ-17.1) shall provide a hyperlink. If the link is followed, the system shall reset and change the user's **password** and email it to the user.

REQ-17.3: The new **password** shall be randomly generated and must comply with SE-5.

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4. External Interface Requirements

4.1 User Interfaces

UI-1: The system shall conform to the *Web Content Accessibility Guidelines (WCAG) 2.0*
UI-2: The system shall provide a tutorial page for every interface that requires user input to explain how to use that interface.
UI-3: The user should be able to navigate to any display they are permitted to view in fewer than four intermediate displays.
UI-4: Displays shall load within 8 seconds or less on a DSL/Cable Connection.
UI-5: The system shall not use more than two fonts or font colors to display text paragraphs.
UI-6: The system layout shall not change if the window is resized or font size is changed.
UI-7: The system shall label all hyperlinks with a particular shade of blue, #1a9de0. This shade of blue shall not be used for anything other than hyperlinks.

Source: Lauren Tsung (2009-02-10)

4.2 Hardware Interfaces

GooGrade runs on a web server accessible via the user's computer using a keyboard and mouse.

4.3 Software Interfaces

GooGrade server-side interface consists of a Linux with an Apache web server. A storage server is needed. The user is able to interact with GooGrade using the any of the supported web browsers. (see OE-1 in section 2.4)

4.4 Communications Interfaces

The main communication interface is HTTP and HTTPS as the GooGrade is web based. Any supported web browser (see OE-1) is able to interact with GooGrade. The system can send **Email** to users. As of version 2 a **Teacher** can compose **Email** and send them to users through the system. Transport Layer Security (TLS) is implemented. All information stored in the system is encrypted.

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5 Other Nonfunctional Requirements

5.1 Performance Requirements

PE-1: GooGrade shall accommodate 200 users during any given time.

5.2 Safety Requirements

No safety requirements are required at this time.

5.3 Security Requirements

SE-1: **User's Account** must be valid and needs to be authenticated by the system in order to use GooGrade to use any function except Reset Password.

SE-2: A **Student** shall not be able to view any other **Account** other than their own. This must comply with Family Educational Rights and Privacy Act (1.3 REF-8).

SE-3: A **Teacher Assistant** will be able to view other **Account(s)** than their own only if they have the Manage User permission.

SE-4: After 5 failed login attempts, the **User** shall be required to wait 10 minutes in order to attempt to log in again.

SE-5: User **Password** must contain at least 6 characters and must include the following: at least 1 number, at least 1 capital character and the **Password** may not be the same as the **Username**.

SE-6: User will be able to reset **Password** once they respond to the confirmation message sent to their email account from the **System**.

SE-7: Transport Layer Security (TLS) will be implemented for communication with the system.

5.4 Software Quality Attributes

QA-1: GooGrade should be simple enough for a first time computer user to adapt within the first week of using it. Simplicity will be measured with a survey (see Appendix C for survey).

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Appendix A: Glossary

- **Admin** - A User with administrative abilities. There are two kinds: Teacher and Teacher Assistant.
- **Application** - the software package to be installed by a host machine.
- **Browser** - A Web Browser, an application like Internet Explorer, Firefox, and Safari to download an interpret web pages.
- **Core [modules]** - The central part of the software managing authorization of users, database connection, external modules etc.
- **Exported Statistics** - A list of classes or students the teacher wishes to save to another format on his or her computer.
- **Features** - Actions that the system can take with data. Features can only be requested from users with appropriate permissions.
- **Host Machine** - The computer in which software is installed and run.
- **Interface** - Also known as a Graphical User Interface (GUI). The graphical, non-functional side of the system.
- **Metrics** - Statistical representations of Grades. for instance, means and modes.
- **Module** - Package of code designed for a or a few related features.
- **OS** - Acronym for Operating System.
- **Roster** - A list of students in a single class.
- **Software** - The final package of code that was produced which can be installed in separate instances.
- **System** - The local instance of the Software and all of it's stored data. It does not include its users.
- **Unregistered User** - A human who attempts to access the system without any permissions.
- **User** - Any human with an Account within the System.
- **Valid** – a quality of an attribute when it exists on the system as defined by the Data Dictionary.

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Appendix B: Data Dictionary

Account = **Username**
+ **Name**
+ **Password**
+ **Permission**
+ **User Type**
+ **Email Address**
+ **Files**

Username = *A string of user's login name, maximum length of 40 characters*

Name = *A string of item's full name. The maximum string length is 200 characters.*

Password = *A password that grants access to a user. It is at least 6 characters long and encrypted*

Permission = *An array of booleans indicating what following features a user is permitted to use: Sending Emails, Upload Files, View Own Grades, Manage Classes, Manage Metrics, Manage Grades, Manage Rosters, Manage Announcements and Manage Users.*

Email Address = *A email address format, represented by a string of 321 characters. that each user has that can be contacted by. The name of the address, the part before the @ sign, must be no longer than 65 characters and the domain, the part after the @ sign, must be no longer than 255 characters. *

File = **Owner**
+ **Name**
+ **Date**
+ **File List**

Owner = * The **Name** of the **Account** that submitted the file *

Date = * The month, year, day and clock time the **File** was submitted *

File List = *A list of 100 stored **files** on the system *

User Type = ["**Teacher**" | "**Teacher Assistant**" | "**Student**"]

Teacher Assistant = *A User type that has permissions equal to or less than a Teacher and more than a Student*

Teacher = 1:5{**Course**}
+ 1:100{**Announcement**}

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Course = 1:200{**Student**}
+ 0:10{**Teacher Assistant**}
+ **Grading Rules**
+ **Course Title**
+ **Course Section**
+ **Course Number**

Course Title = *A string of 100 characters indicating the title of class, such as "Introduction to Welding"*

Course Section = *A positive integer indicating the section number of the class, if the integer is single digit than a leading zero is displayed. *

Course Number = *A string of 32 characters indicating the short class name, "CSC308"*

Grading Rules = Percentages
+ **Course Curve**

Course Curve = *Five numbers indicating the minimum Total Grade required to obtain an A, B, C, and D*

Percentages = * An array of integers indicating the percentage of the Total Grade different types of Assignment Grade make up. There are 6 numbers, each for Homework, Test, Quiz, Final, Participation and Other. All numbers in the array have a sum of 100*

Announcement = **Announcement Title**
+ **Announcement Text**
+ **Announcement Date**

Announcement Date = *A date and time in the default date and time format on the Host computer when the Announcement was published*

Announcement Text = *A long string of 10,000 characters that indicated text body of announcement post*

Announcement Title = *A string of 200 characters that indicates the title of the announcement

Student = 1:100{**Assignment Grade**}
+ **Total Grade**

Total Grade = *A calculated floating point number, the total score of **Assignment Grades**, and a character, representing the letter grade, based on the **Assignment Grade***

Assignment Grade = **Assignment**

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+ **Assignment Score**

Assignment Score = *A floating point number and letter grade, represented by a char, depicting the score of the assignment.*

Assignment = [Test | Quiz | Homework | Participation | Other]
+ **Due Date**
+ **Name**
+ **Assignment Total**
+ **Description**

Due Date = *The date, using the host machine default for time and date, when the **Assignment** must be turned in to the **Teacher***

Assignment Total = *A floating point number and a char depicting the total possible score points on this A**ssignment***

Email = **Email Body**
+ **Email Title**
+ **Email Attachment**
+ **Email Recipients**

Email Body = *A string of text written by a user that acts as the body of the email. It holds a maximum of 10,000 characters.*

Email Title = *A string of 100 characters for the title of email*

Email Attachment = *A string address of file to be uploaded and sent. It is no longer than 255 characters*

Email Recipients = *A list of email addresses of the destinations. Each list item is a string of 321 characters.*

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Appendix C: Storyboards

C-1: Student Home screen

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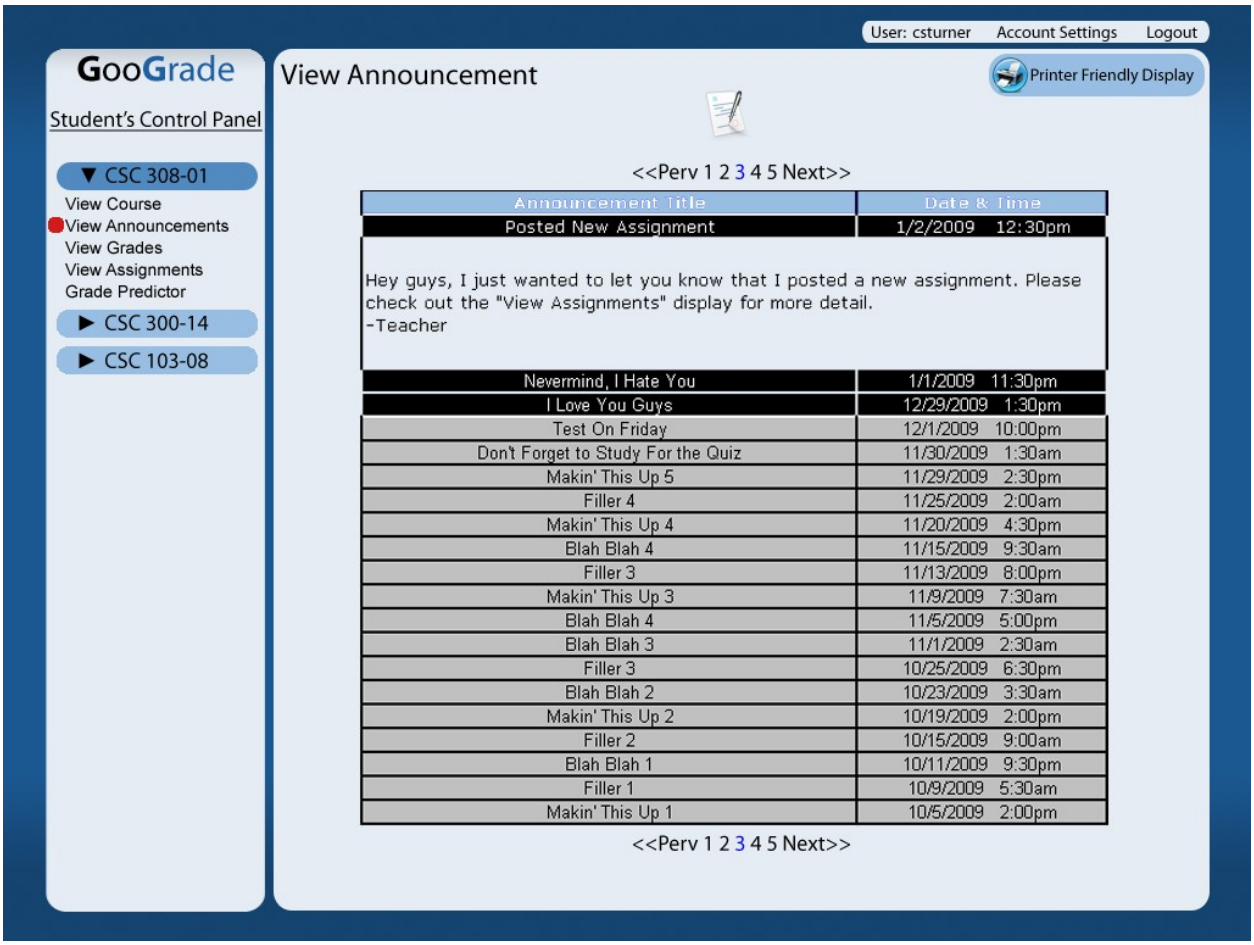
C-2: Student View Announcement



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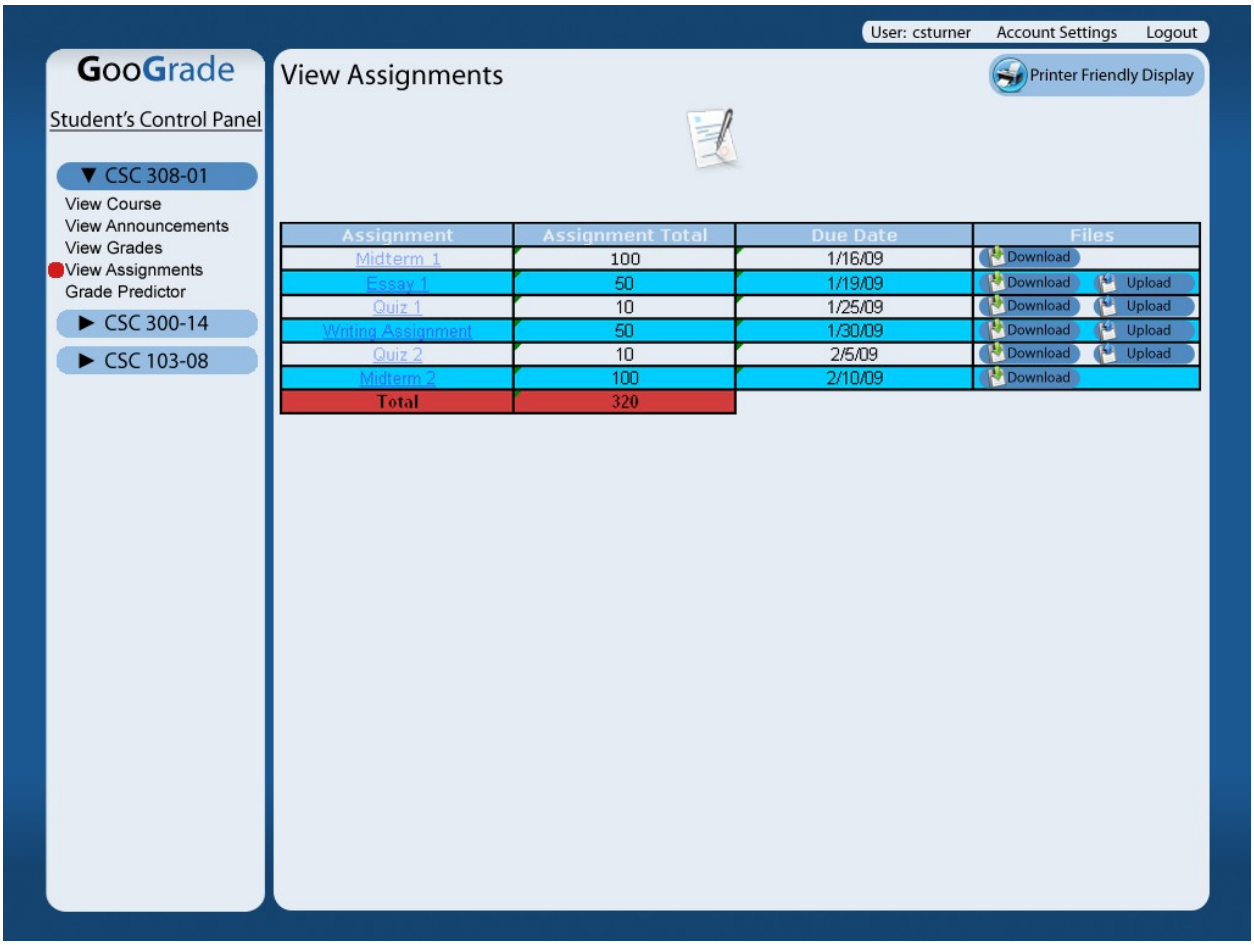
C-3: Student View Assignments



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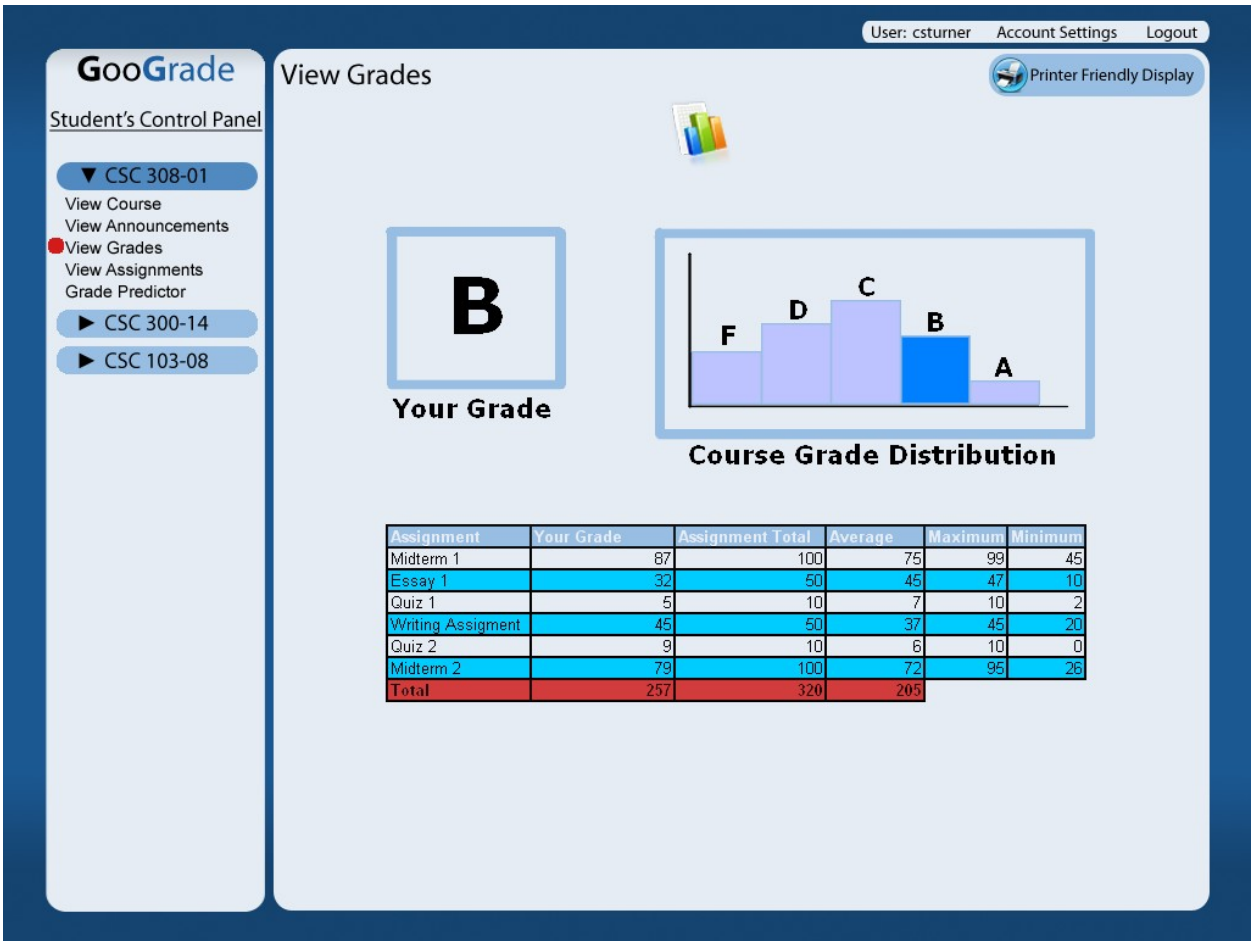
C-4: Student View Grades



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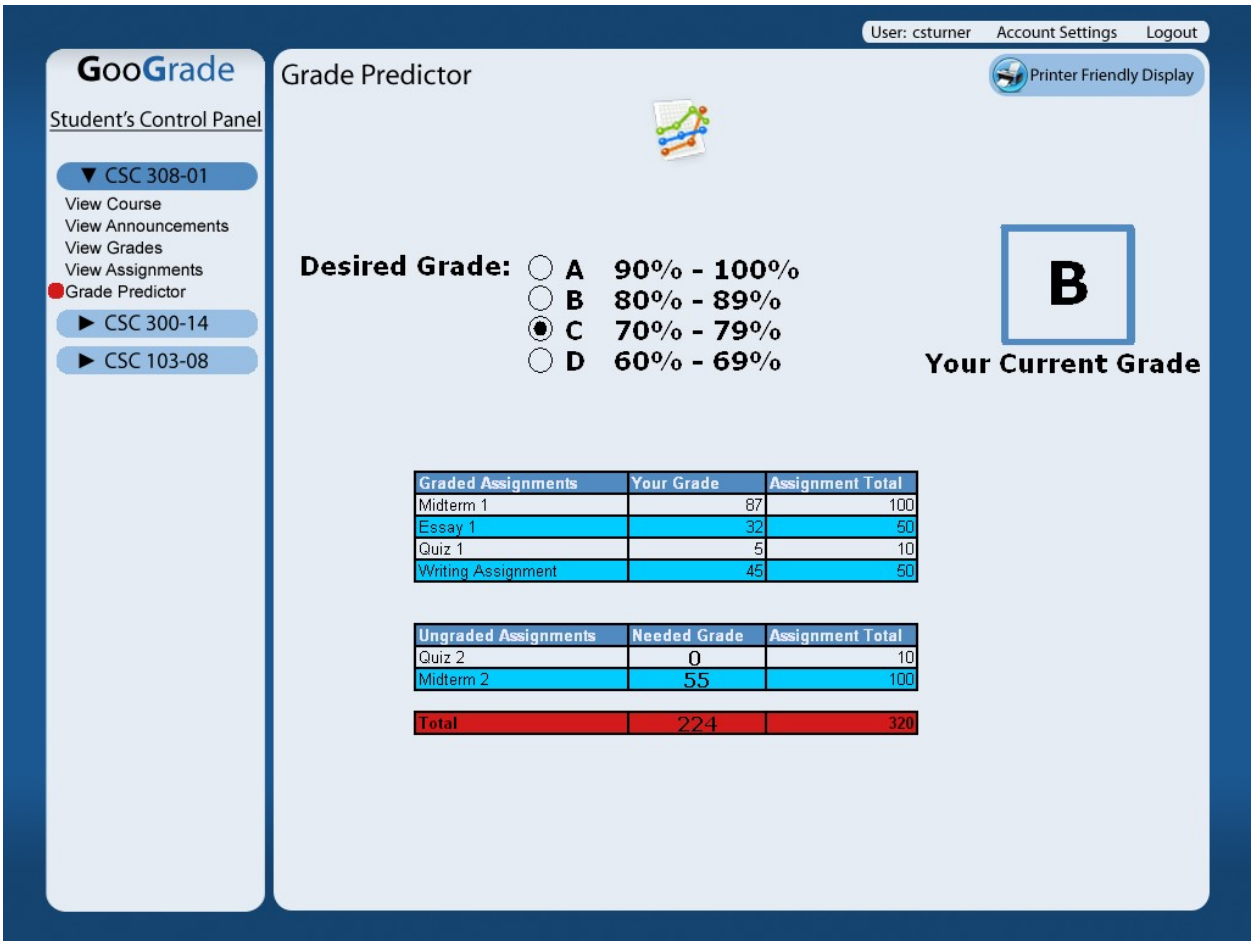
C-5: Student Grade Predictor



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C-6: Edit My Account

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C-7: Edit My Account Error

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C-8: Teacher Home screen

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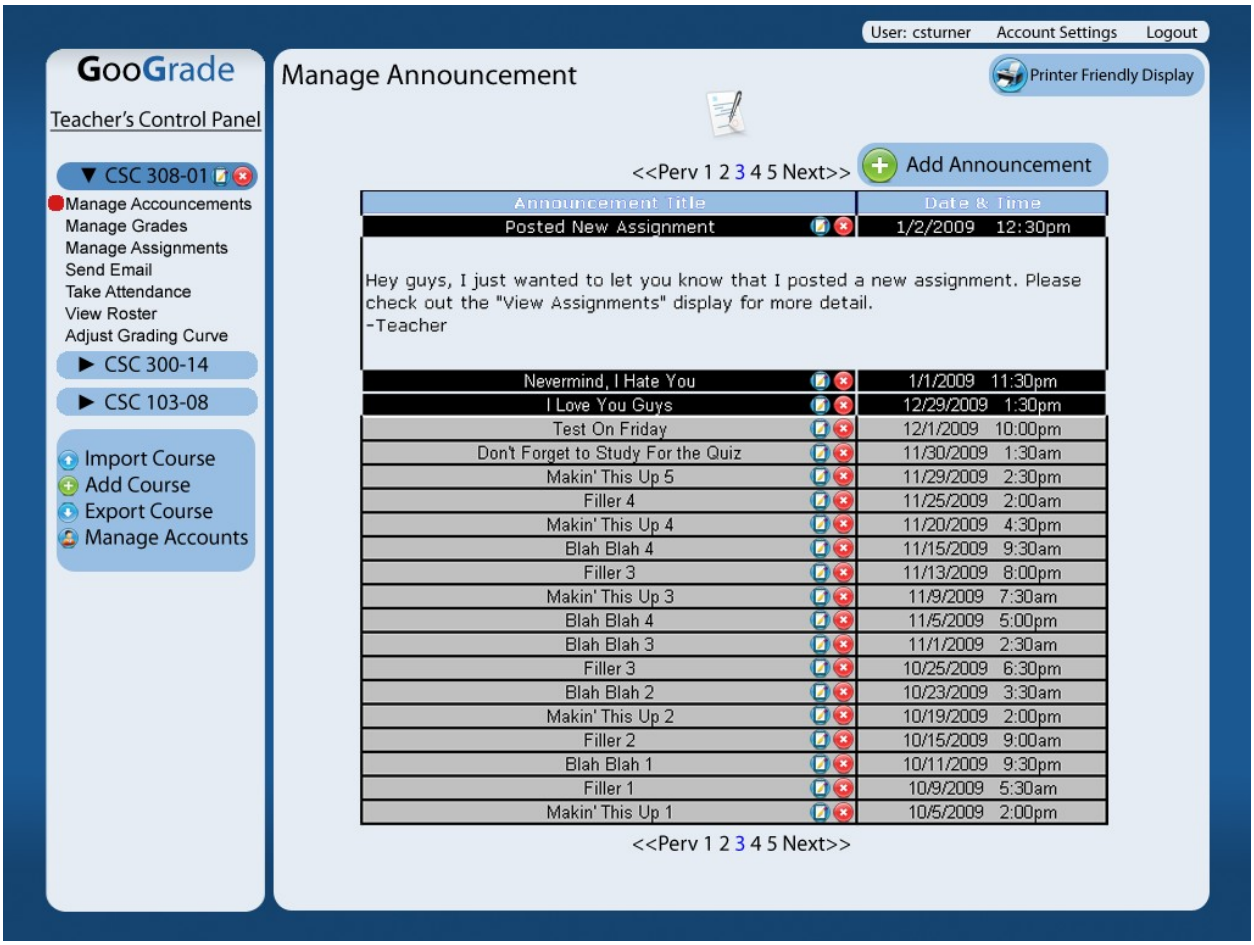
C-9: Teacher Manage Announcement



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C-10: Teacher Manage Announcement Error

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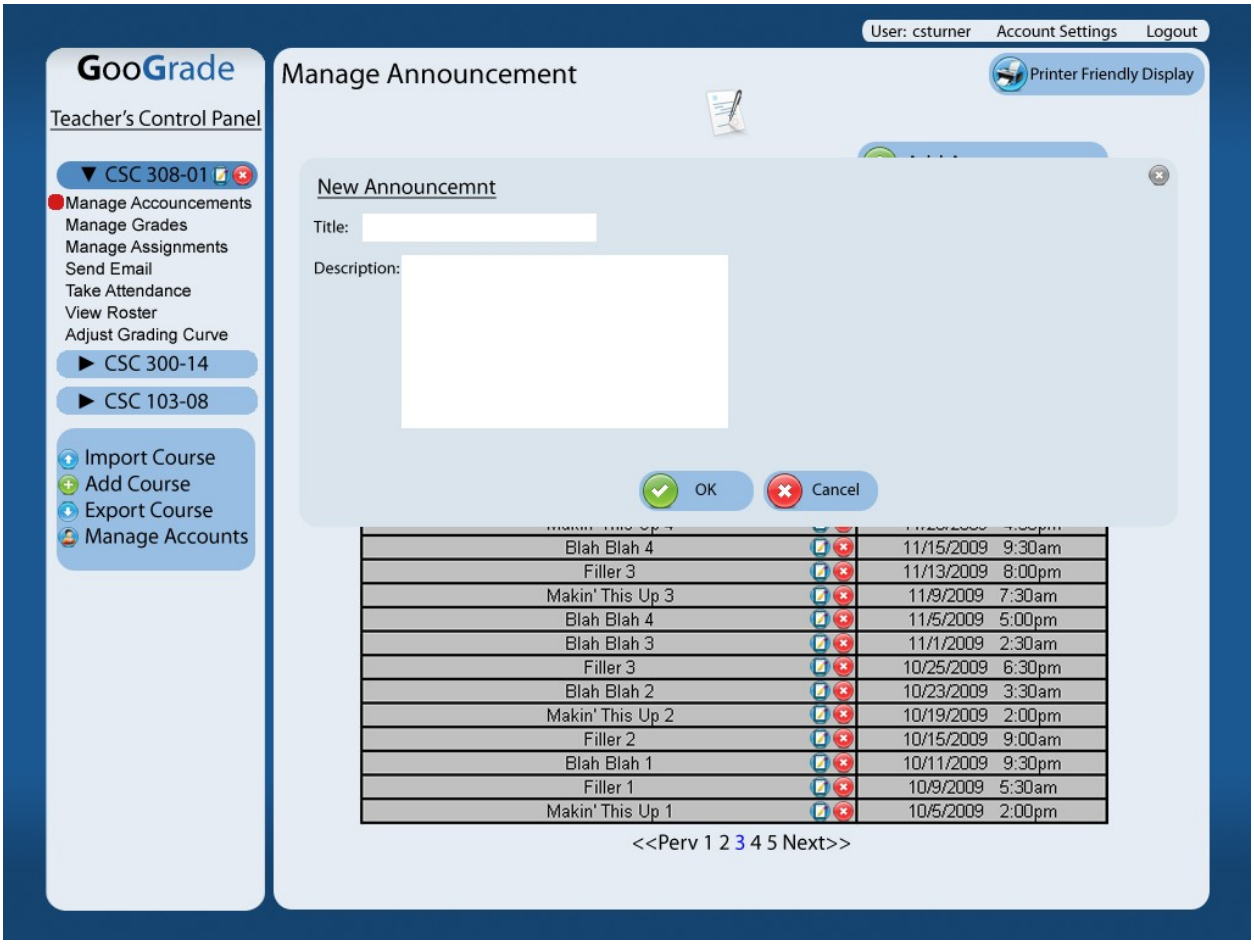
C-11: Add Announcement



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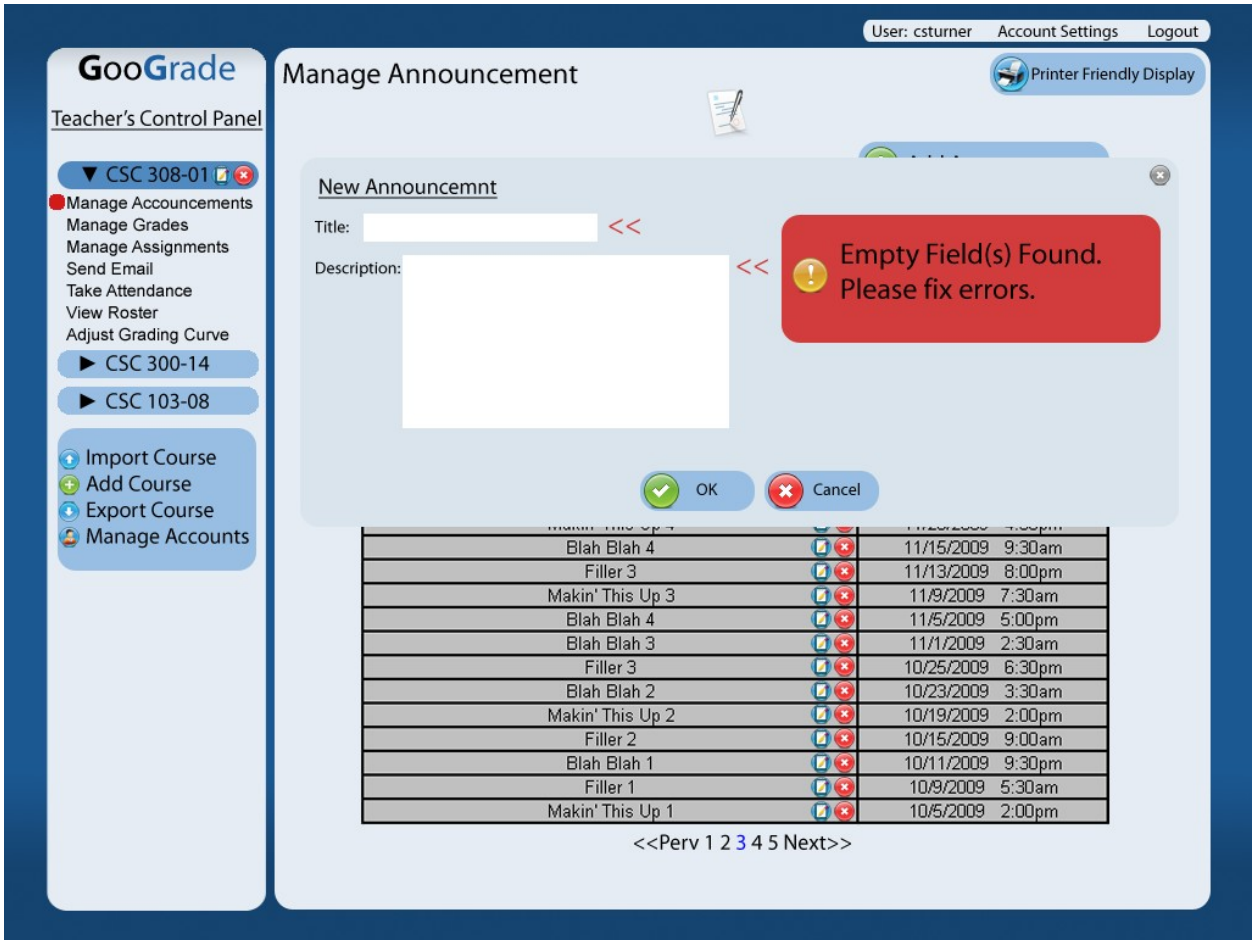
C-12: Add Announcement Error



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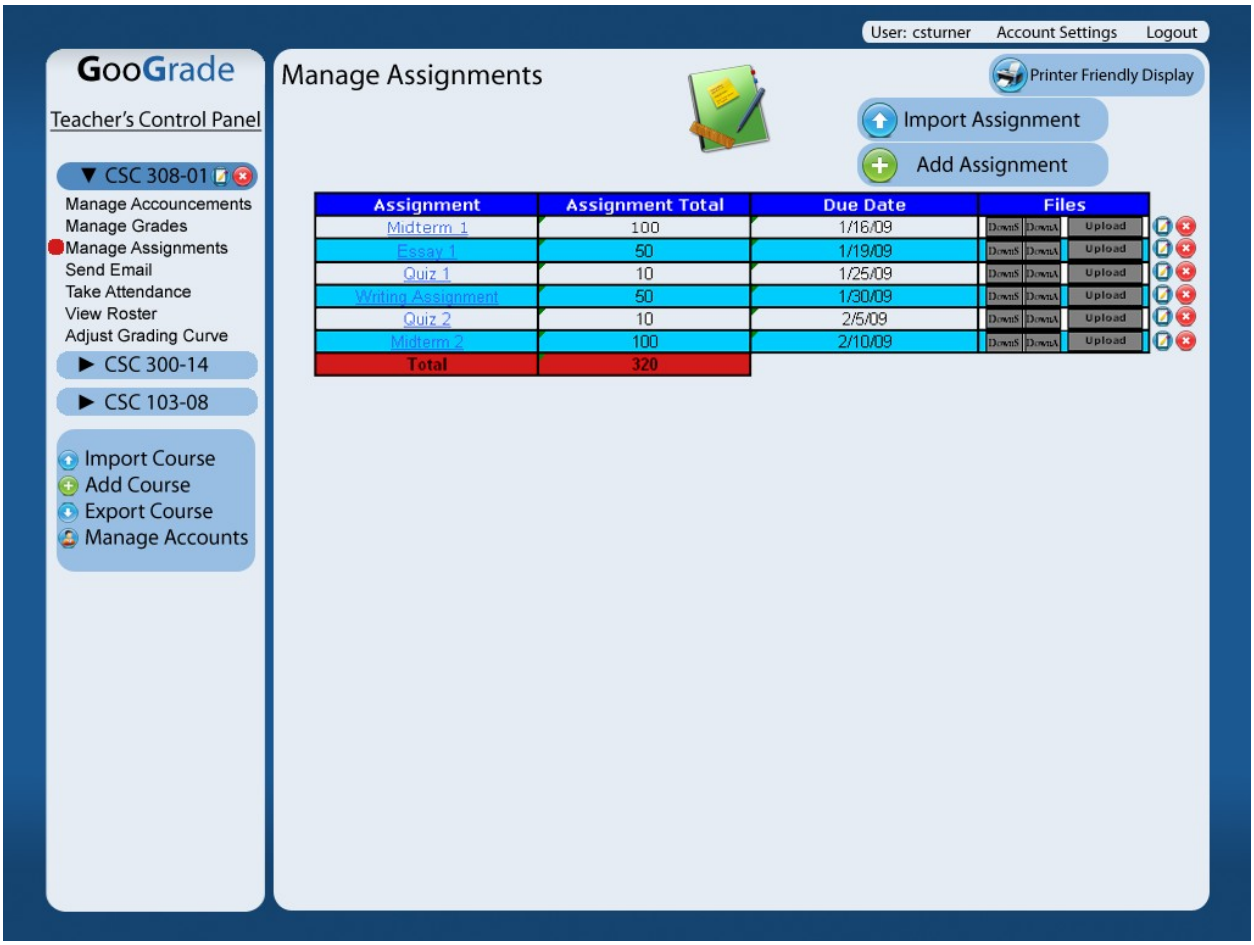
C-13: Teacher Manage Assignments



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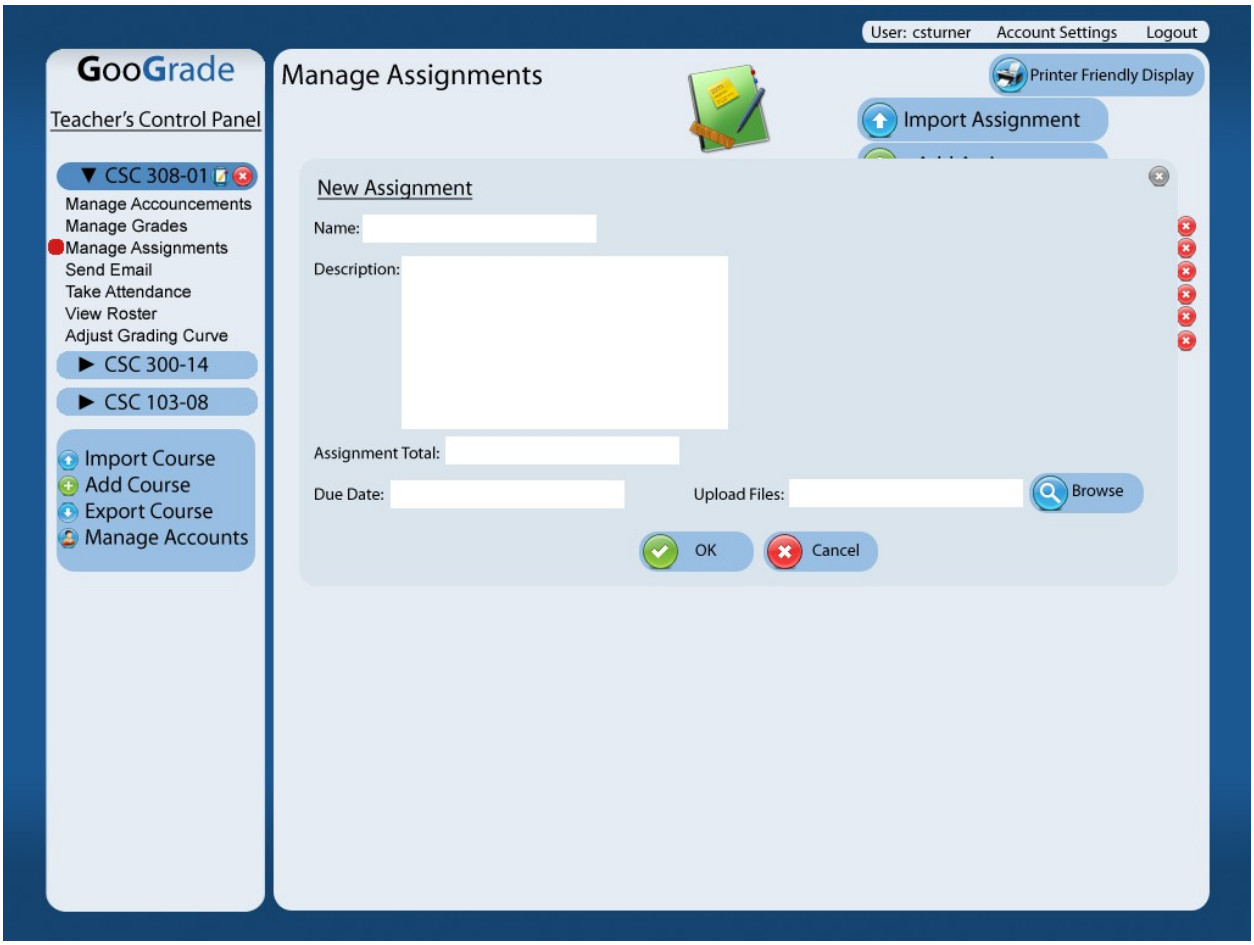
C-14: Teacher Manage Assignments Add



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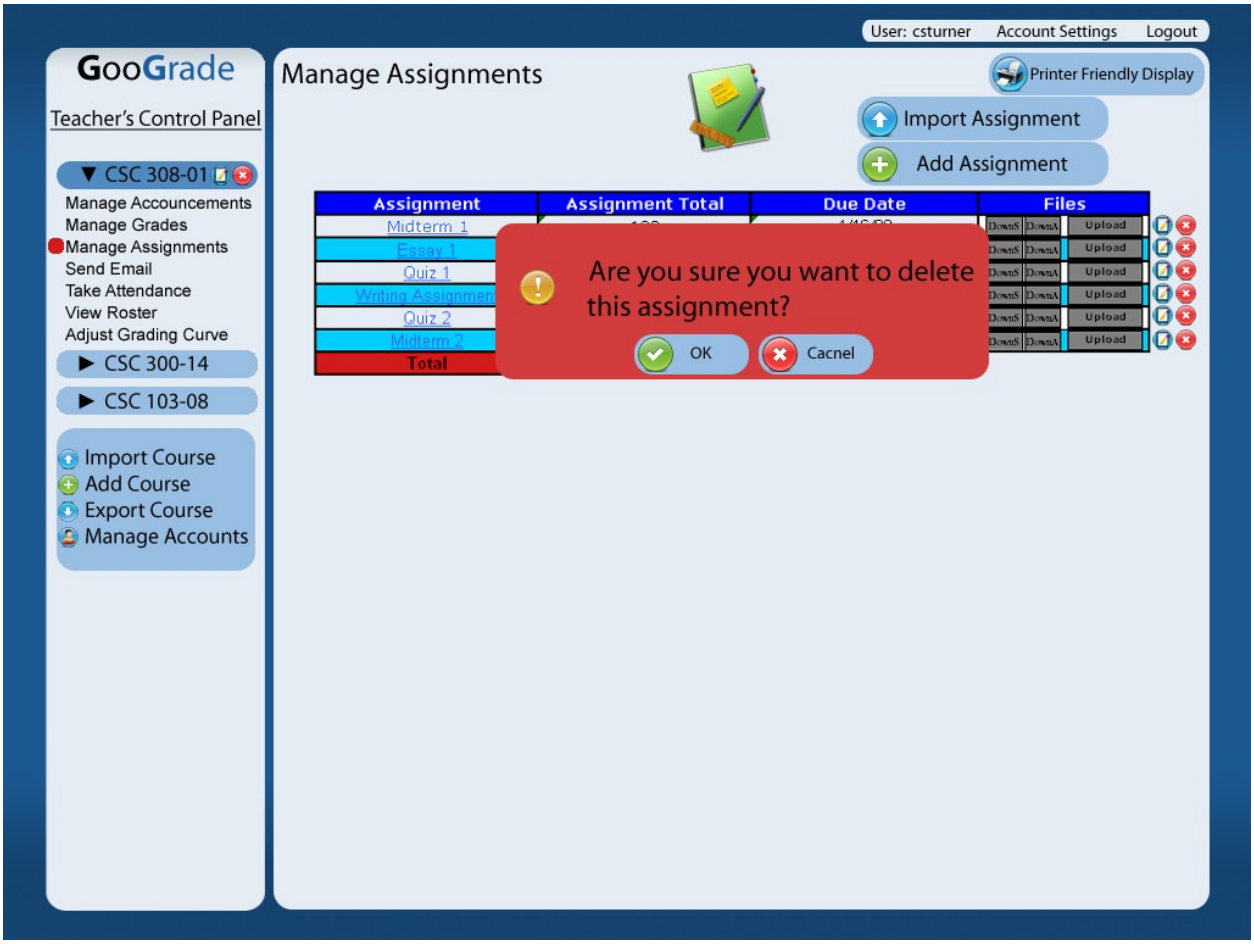
C-15: Manage Assignment Delete



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C-16: Manage Assignment Error

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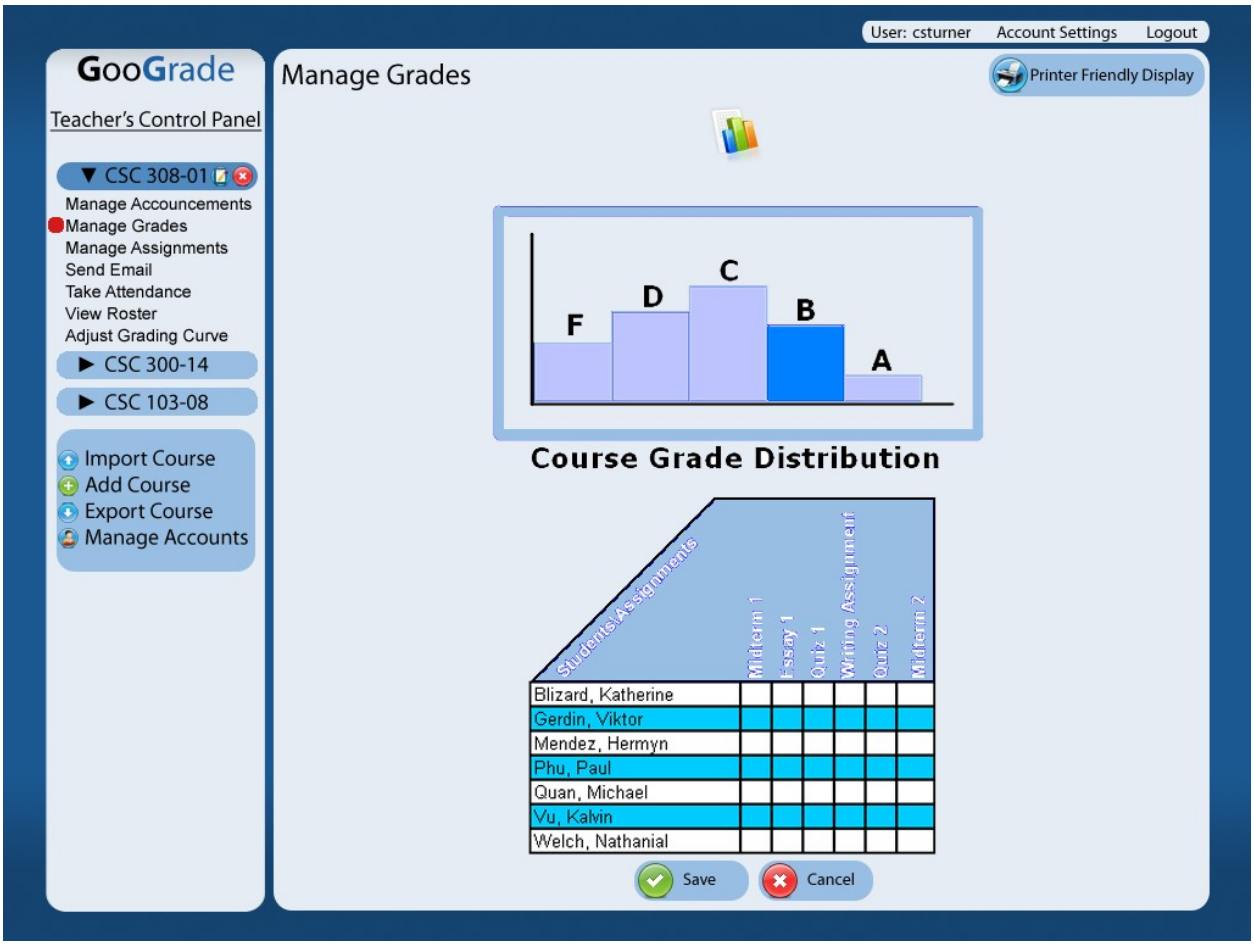
C-17: Teacher Manage Grades



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C-18: Teacher Manage Accounts

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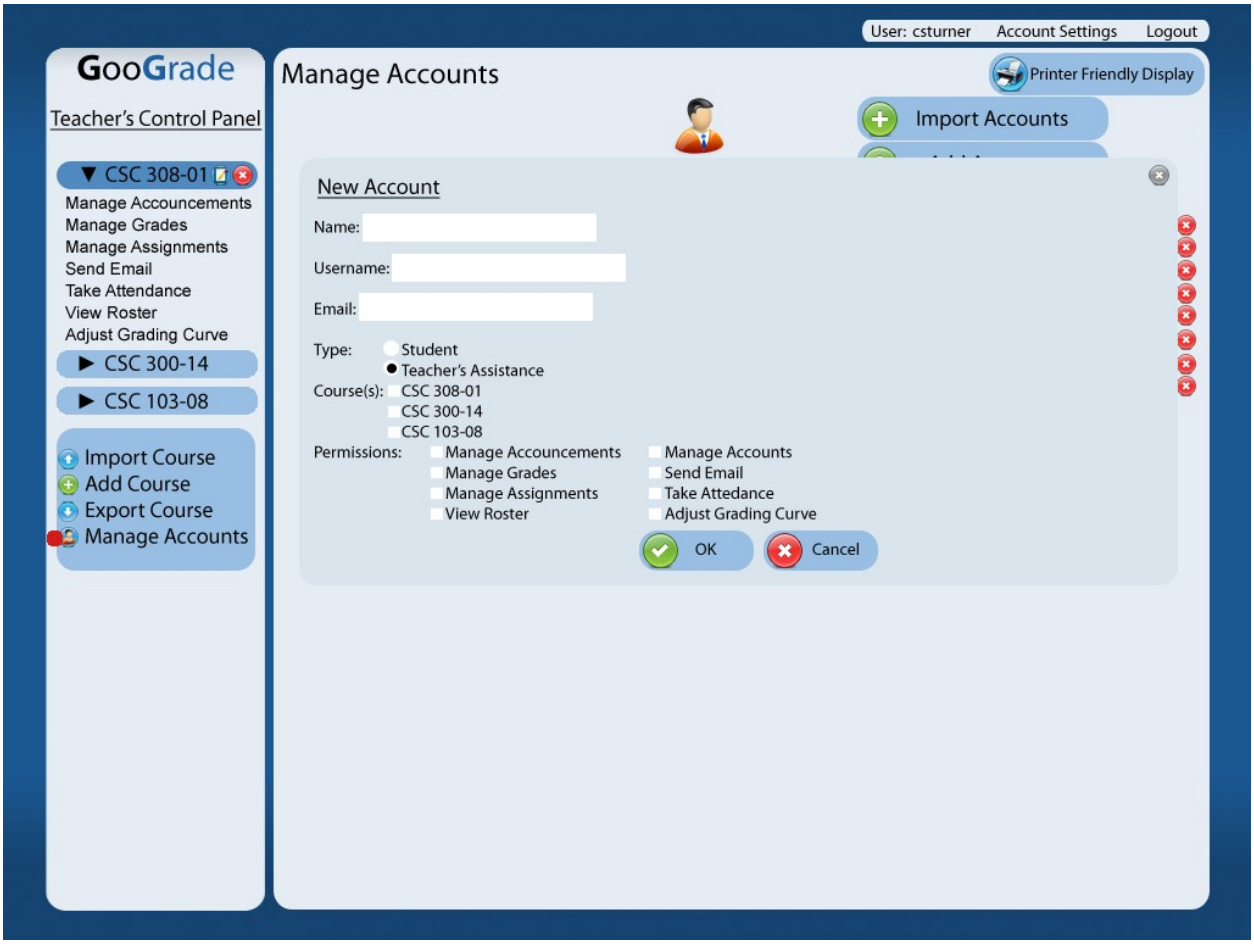
C-19: Add Account



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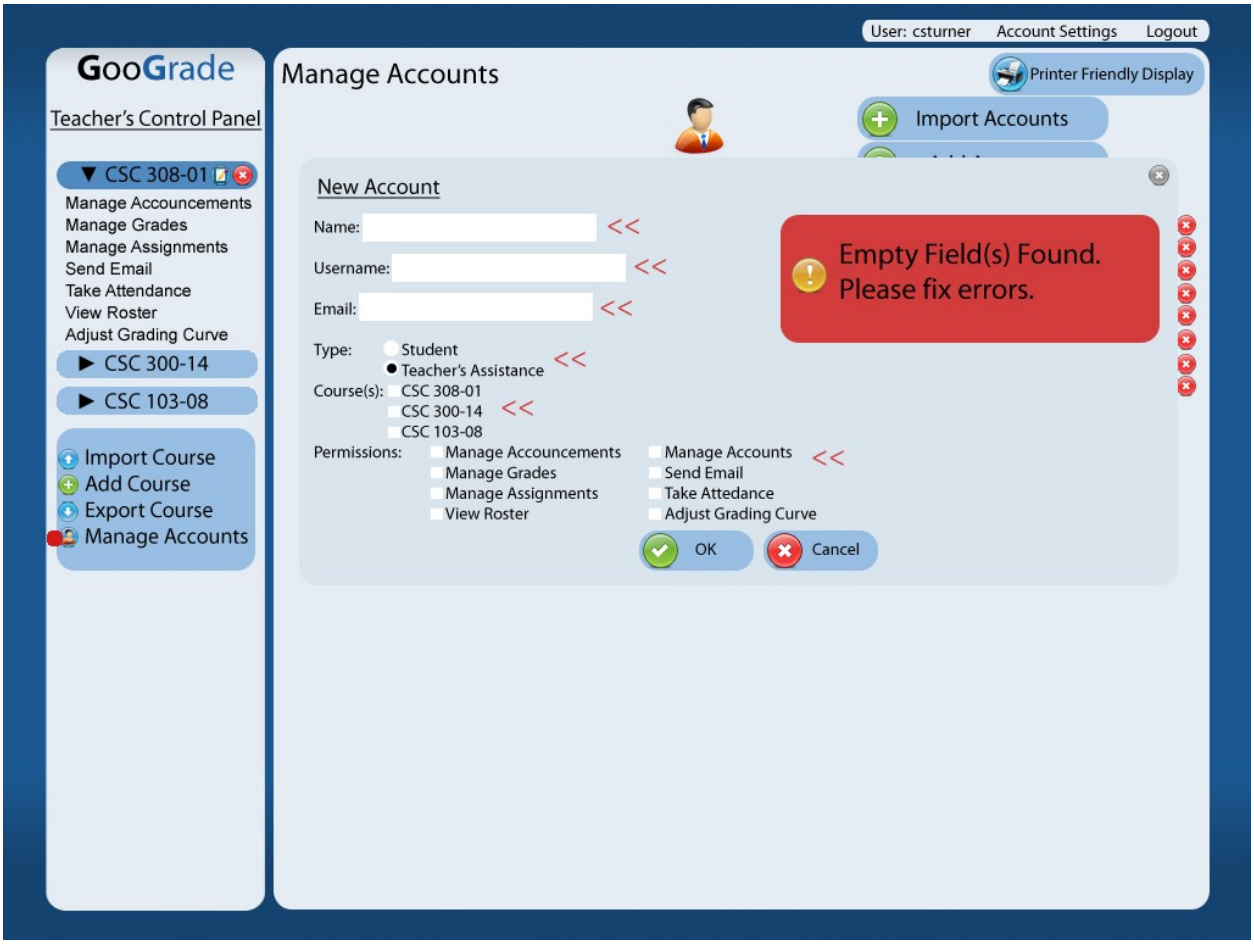
C-20: Add Account Error



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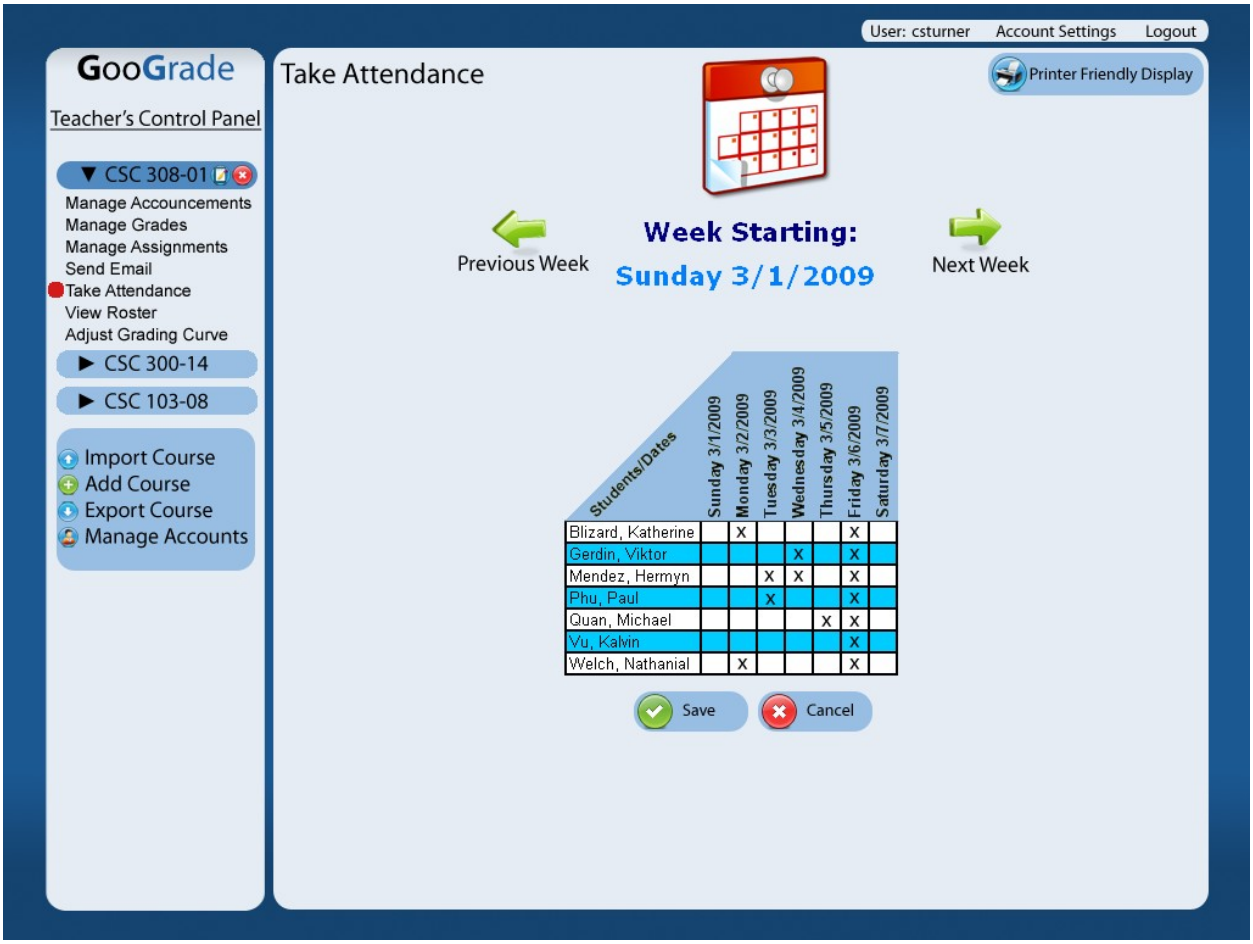
C-21: Take Attendance



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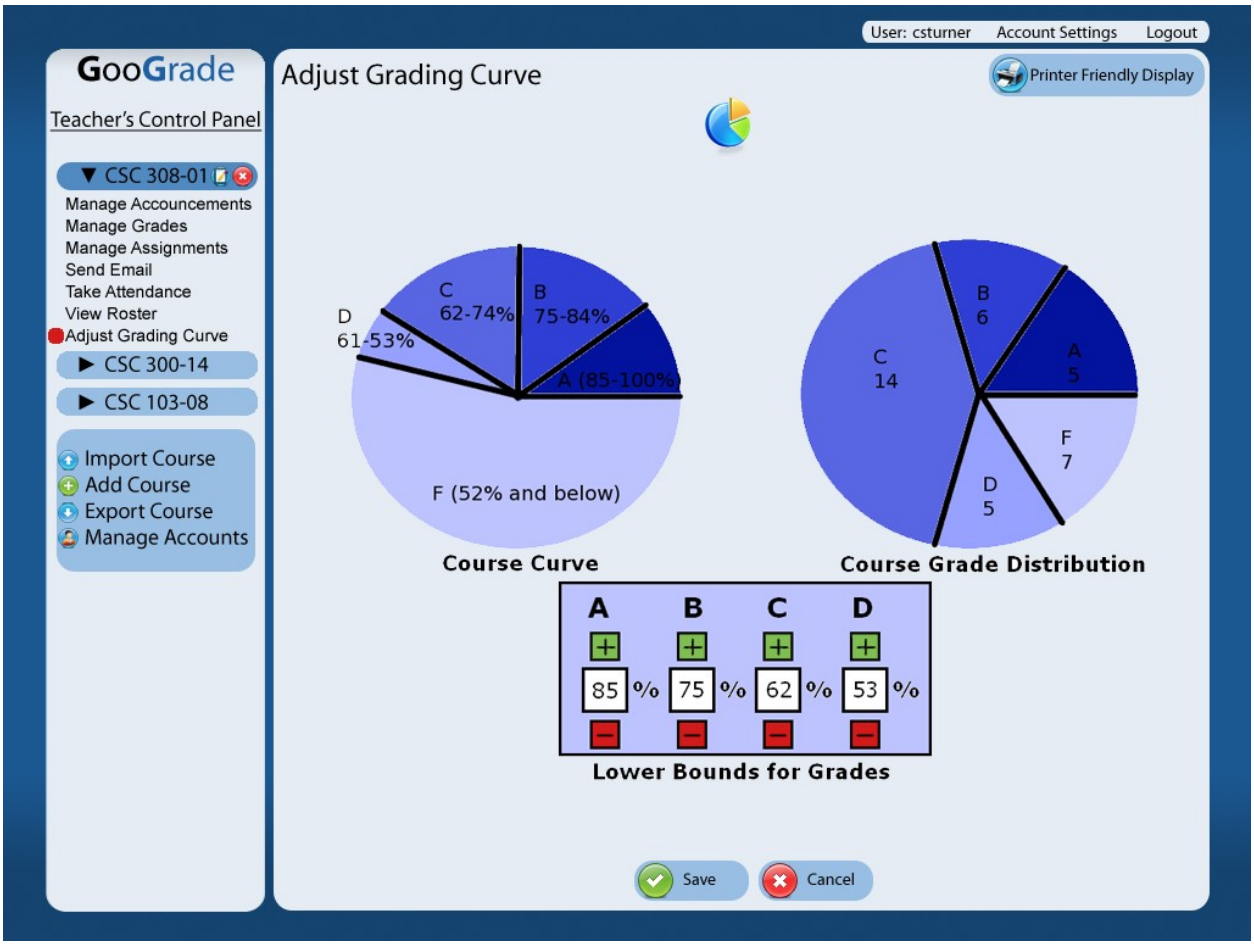
C-22: Teacher Adjust Grading Curve



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Appendix D: Analysis Models

Survey

Name:

Date:

Are you a teacher or student?

How many weeks have you been using GooGrade for? (round to nearest whole number)

Please rate your overall experience with GooGrade on a 1-10 scale (1 = poor, 10 = excellent)

Please rate the GooGrade's features list on a 1-10 scale (1 = poor, 10 = excellent)

Please rate the ease of use of GooGrade on a 1-10 scale (1 = difficult, 10 = easy)

Please rate the GooGrade's graphical user interface on a 1-10 scale (1 = poor, 10 = excellent).

Appendix E: Use Cases

Use Cases for GooGrade are located in the attached document labeled Use Cases.

Appendix F: Test Cases

Test Cases for GooGrade are located in the attached document labeled Test Cases.

Appendix G: System Architecture

The Architecture for GooGrade is in the attached document labeled Architecture.

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