Group 1
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Software Requirements Specification

Document

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1. Introduction

1.1 Purpose

The purpose of this document is to outline the requirements, specifications and features of the class planner web application.

1.2 Scope

This web application will be a University course planner for UNL students. Students will be able to choose a major and minor, they will have access to the university course catalog which will be displayed in a combination of auto populated lists as well as a searching option. The students will be able to view details of the classes and move desired classes to their preferred semesters. In later phases the web application will have additional functionality like planner validation where the application will be able to inform the students if their chosen classes satisfy the major they selected; as well as saving and/or exporting the course plan.

1.3 Definitions, Acronyms, and Abbreviations.

Web Application: A complete application that will be hosted on a webserver to be accessed via internet by end users.
Web App: Shorthand for web application.
UNL: Abbreviation for University of Nebraska-Lincoln.
CSE: Computer Science and Engineering (in reference to the UNL CSE department)
CDN: Content Delivery Network.
UI: User Interface
GUI: Graphical User Interface.
ACE: Abbreviation for Achievement-Centered Education.
Interface: A component of the web application which may be interacted with.
Feature: A component of the web application.
CDR: College Distribution Requirements
Session: The period of time that a user is accessing the system.

1.4 Overview

The rest of this document will cover the overall description, the specific requirements, and an appendix for the app. Section 2 will describe the overall use and purpose of the app. Section 3 will discuss the details and design structure of the app and its features. The appendix includes some examples of what the webapp is expected to look like.

2. The Overall Description

2.1 Product Perspective

2.1.1 System Interfaces

The web application will rely on the UNL web server for hosting purposes.

2.1.2 Interfaces

The web application will have a user interface in the form of a webpage that will contain graphical elements for the students to interact with. There will be a combination of dynamic functional elements that the student can use to develop their course plan; such as, draggable objects, drop down menus and dynamically changing course lists as well as static display elements; such as, the general layout of the planning board..

2.1.3 Hardware Interfaces

The system has no hardware interface requirements.

2.1.4 Software Interfaces

The system is required to run on the Google Chrome and Mozilla Firefox web browsers. These two browsers combined represent 72.19% percent of market share according to netmarketshare.com.

2.1.5 Communications Interfaces

The web application will use standard internet protocols.

2.1.6 Memory Constraints

The web application will be stored on and launched from the UNL computer science department server. Each user has a maximum of 300 MB of data available to them. The application is not expected to require more than 100 MB of data.

2.1.7 Operations

The primary operation of the web application will be to allow the user to interact with the GUI. The front end will communicate with the backend which will handle all database queries and return the necessary data the user requires.

2.1.8 Site Adaptation Requirements

The web application does not require any adaptation requirements.

2.2 Product Functions

The function of this webapp is to provide UNL students the ability to lay out a complete course plan by semester. The application will also provide a downloadable pdf file of their finalized course plan. In later iterations, the application will be able to validate a course plan based on UNL graduation requirements or supported majors / minors.

2.3 User Characteristics

The web application will be targeted towards university students. Having basic technical knowledge of navigation on the web will be required. Most university students should have no problem interacting with the user friendly features. Our web application will not be limited in any way by the potential user base.

2.4 Constraints

The webapp will limit browser support to Chrome, Firefox and Safari. The reasoning is the outdated support of Internet Explorer mobile will not be directly supported. Mobile devices will be able to access the website but the displayed results will not be optimal.

2.5 Assumptions and Dependencies

The web is an ever changing entity and the technology used to develop web applications changes rapidly. Thus, the web app will be built to support the different browsers and other media used to access the web.

2.6 Apportioning of Requirements.

The priority for Phase 1 is to get all the base functionality done including but not necessarily limited to: major/minor selection, sorted course list(s), course information, planning board interactions, course search and ACE requirement validation.

Phase 2 and future goals will bring additional functionality such as: user accounts, save/export progress, graduation requirements validation, prerequisite validation and GUI enhancements.

3. Specific Requirements

3.1 External Interfaces

Planning Board: The Planning Board serves as the main point of interaction for the user. The screen format of the Planning Board will be as seen in Appendix 4.1 and input comes from mouse interactions while interacting with courses and semester containers or keystrokes while interacting with the search feature. Response from the interface will occur within one second of interaction with the exception of searches which will return within five seconds.

The Planning Board will impact tracking for prerequisite validation as well as ACE requirements and degree requirements. As the interface is interacted with the tracking information for these three items will update as well.

Data will be stored and formatted in a database. Queries to the database will be sent and data returned to the system to be displayed for the user.

3.2 Functions

3.2.1 Phase 1

3.2.1.1 Choose Major/Minor

3.2.1.1.1 The purpose of this feature is to make the process of a user planning their courses more convenient by presenting the user with a pool of relevant courses which pertain to their chosen major and or minor.

3.2.1.1.2 The user will see a prompt to select their major and minor, and will be able to interact with a widget to specify them.

3.2.1.1.3 Associated functional requirements

3.2.1.1.3.1 Select Major: The user will be able to specify their major. Selecting a major makes degree planning more convenient for the user because it automatically presents the user with relevant courses for them to utilize whilst developing their degree plan - thereby reducing time spent searching through the many possible courses.

3.2.1.1.3.2 Select Minor: The user will be able to specify their minor. Selecting a minor makes degree planning more convenient for the user because it automatically presents the user with relevant courses for them to utilize whilst developing their degree plan - thereby reducing time spent searching through the many possible courses.

3.2.1.1.3.3 Navigate to Degree Requirements: By specifying a major and minor for the degree plan, the web application will automatically present a relevant pool of courses to the user for their convenience. However, it is still up to the user to decide which courses are necessary to fulfil the requirements for their degree. The web application will automatically present the user with the appropriate links to navigate to a webpage which describes the requirements for their chosen major and or minor.

3.2.1.2 Course Search

3.2.1.2.1 The purpose of this feature is to provide a convenient interface for the user to search for courses which have not already been automatically presented by other interfaces..

3.2.1.2.2 The user will see a prompt inside a widget indicating that its purpose is for searching for additional courses which have not already been provided by the major/minor selection process. The user will be able to interact with this widget to perform the searches.

3.2.1.2.3 Associated functional requirements

3.2.1.2.3.1 Search: The user will have access to a widget which allows them to access any existing course UNL has on file. After finding and selecting the desired course, the user will be able to utilize said course in their degree planning activities.

3.2.1.2.3.2 Search Suggestions: While typing, the user will be presented with potentially matching suggestions until the correct course is found or until there are no more suggestions to offer - indicating that the course is not currently accessible.

3.2.1.3 Planning Board

3.2.1.3.1 The purpose of this feature is to provide a ‘hub’ for the user’s course planning and organizing experience. Classes may be placed into dynamic and customizable labeled containers, enabling the user to easily visualize their course plan as they develop it.

3.2.1.3.2 The user will be presented with the Planning Board and widgets which allow them to interact with it, such as by adding a new semester or editing the name of an existing one.

3.2.1.3.3 Associated functional requirements

3.2.1.3.3.1 Semester Containers: There will exist labeled ‘containers’ on the Planning Board. The containers will be labeled with a semester and year (e.g. “Fall 2019”) and they will have the ability to store courses inside of them - enabling the user to easily visualize which courses will be taken in which semester as they plan their progression through their degree.

3.2.1.3.3.2 Drag and Drop: The user will be able to drag courses from various widgets and drop them into the desired semester containers. This makes the planning process quick and simple for the user.

3.2.1.3.3.3 Add/Remove Semester: The user will have the ability to add and remove semesters from the board. This makes the Planning Board dynamic and flexible enough to fit any individual student.

3.2.1.3.3.4 Edit Semester: The user will have the ability to edit the label of a semester container. That is to say, if the container says ‘Fall 2019’, they will be able to change the label to something else, such as ‘Spring 2020’.

3.2.1.4 Course Information

3.2.1.4.1 The purpose of this feature is to provide a convenient interface from which they can read information about a specific, chosen course.

3.2.1.4.2 The user will be presented with courses displayed within various interfaces in the application. Clicking on a course will display relevant information to the user.

3.2.1.4.3 Associated functional requirements

3.2.1.4.3.1 Display Course Description: There will exist an interface which displays a course description about the selected course.

3.2.1.4.3.2 Display Prerequisite Info: There will exist an interface which displays information regarding prerequisites the course may have.

3.2.1.4.3.3 Display ACE Info: There will exist an interface which displays information regarding which ACE(s) the course may fulfill.

3.2.1.5 ACE Fulfillment Tracking

3.2.1.5.1 The purpose of this feature is to provide a convenient, visual interface which displays status information about the user's current ACE fulfillment.

3.2.1.5.2 This is a passive feature which presents different information to the user depending on their interactions with other interfaces within the web application.

3.2.1.5.3 Associated functional requirements

3.2.1.5.3.1 Tracker: There will exist an interface which has awareness of ACE information for each course that is present on the Planning Board.

3.2.1.5.3.2 Display: There will exist an interface which displays the currently fulfilled and unfulfilled ACE requirements.

3.2.2 Phase 2

3.2.2.1 Save Progress

3.2.2.1.1 The purpose of this feature is to allow the user to save the course planning progress they have made so that if they do not finish their planning in a single sitting or if they desire to make changes at a later time they can do so without having to start from scratch.

3.2.2.1.2 The user will be presented with a menu option that allows them to save their current work. It will also be possible for the user to export their work to a PDF.

3.2.2.1.3 Associated functional requirements

3.2.2.1.3.1 Save: The user will have the ability to save the current state of the Planning Board such that, after terminating the current session, they will be able to resume from where they left off upon starting a future session with the web application.

3.2.2.1.3.2 Export to PDF: The user will have the ability to download the current state of the Planning Board into a convenient PDF representation for local storage.

3.2.2.2 Prerequisite Validation

3.2.2.2.1 The purpose of this feature is to provide a convenient, visual interface which displays status information about the user's current prerequisite fulfillment. *This feature will only be developed within the web application to the extent that time permits.*

3.2.2.2.2 This is a passive feature which presents different information to the user depending on their interactions with other interfaces within the web application. Warnings about required prerequisites will be presented to the user if they have placed an invalid sequence of courses on the Planning Board.

3.2.2.2.3 Associated functional requirements

3.2.2.2.3.1 Tracker: There will exist an interface which has awareness of prerequisite information for each course which is present on the Planning Board.

3.2.2.2.3.2 Display: There will exist an interface which displays the currently unfulfilled prerequisite requirements. Courses which have been placed on the Planning Board but which are invalid (prerequisites have not been met) will appear differently than a valid course.

3.2.2.3 Degree Requirements Tracking

3.2.2.3.1 The purpose of this feature is to alert the user to degree requirements which have not yet been fulfilled. This will help the user to better plan their courses. *This feature will only be developed within the web application to the extent that time permits.*

3.2.2.3.2 This is a passive feature which presents different information to the user depending on their interactions with other interfaces within the web application. There will exist an interface with which the user may interact to find helpful information regarding unfulfilled degree requirements.

3.2.2.3.3 Associated functional requirements

3.2.2.3.3.1 Tracker: There will exist an interface which has awareness of degree requirement information for each course that is present or missing on the Planning Board.

3.2.2.3.3.2 Display: There will exist an interface which will alert the user to degree requirements which yet remain unfulfilled, considering the current state of the Planning Board.

3.3 Performance Requirements

This application will be able to support use by all students enrolled at UNL. Thus the number of transactions and tasks at any given time can vary based on the number of students enrolled at the institution. To this end the system should be able to handle:

(a) 100 simultaneous requests for all course data of a single major
(b) User-interface interactions which shall be processed in less than 1 second
(c) Any occurence of course retrieval which shall be processed in less than 5 seconds for a user

3.4 Logical Database Requirements

This application will keep a database of all courses offered at UNL. The database will store the following types of information: course ID, course title, course description, prerequisite designations, credit hours, and ACE requirement satisfaction. This is a significant utility for the user and it is likely to be utilized consistently throughout a session. During phase II a login will be implemented allowing the user to store progress between sessions.

3.5 Design Constraints

The system will be deployed on the UNL CSE server. This means that we are subject to the software availability and hardware specifications of this system.

3.5.1 Standards Compliance

The system will utilize existing course data available from UNL. Because of this reliance on existing data the formatting of data will mirror the format used at UNL. No other regulatory regulations will be placed upon the system.

3.6 Software System Attributes

3.6.1 Reliability

3.6.1.1 By utilizing the UNL cse server, we are granted access to a consistently reliable server with database connectivity and regular maintenance. To ensure that the course planner system's implementation is reliable, we will subject it to predefined test cases with the intention of breaking system components. Strict output requirements will be defined for exception handling and our test cases will be defined to trigger those test cases to simulate erroneous user input or database inconsistencies.

3.6.1.2 Data imported from the UNL API is maintained by the UNL website developers and therefore some data imported to the system may be out of date or incomplete. Data for fields that are consistently incomplete will be omitted from the functionality of the system and the user will be encouraged to validate course information for courses selected in the plan with the most recent UNL course catalogue.

3.6.2 Availability

The system shall be available 24 hours a day for 29 days of each month. The remaining days in the month shall be used for maintenance as needed. The system shall allow users to restart whenever they desire insofar as they are able to select a new Planning Board at any time. System failures beyond choosing to start a new planning session will require administrator intervention.

3.6.3 Security

As accounts are not required to utilize the system no additional security is needed for users. Input validation will be used on searches to avoid injection attacks onto the database. No other security measures will be utilized in the system.

3.6.4 Maintainability

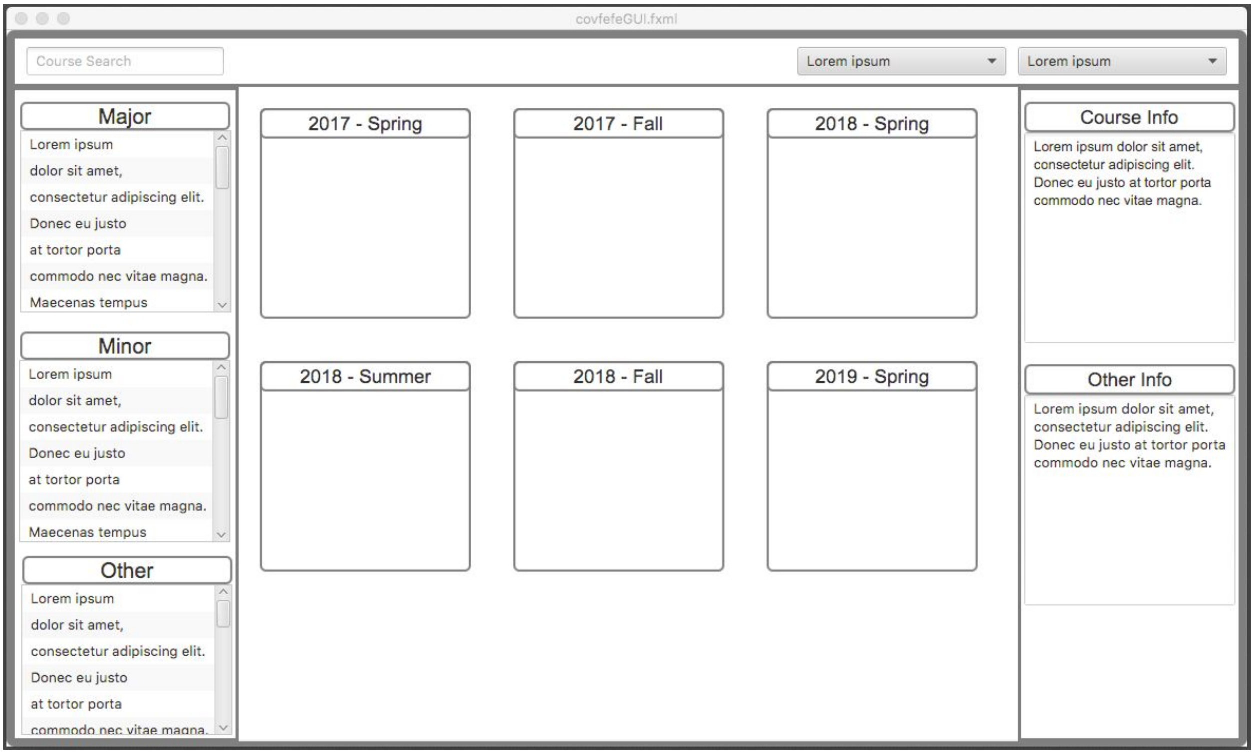
As much as possible, development will take a top-down, modular approach to keep things open and extensible. Degree requirements and prerequisite validation are two rather large tasks we hope to implement primitive functionality for - we hope to leave development surrounding these topics in an easily extensible state so all majors in each UNL college may someday have full validation functionality available.

3.6.5 Portability

This project is web-based and, as such, doesn't directly require special portability considerations.

4. Appendix

4.1 Planner Layout



Course Info

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Other Info

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