**PROJECT TITLE: GradTrak**

CMPS 4910 Senior Project I

Group Members: Shadi Abdul Razzak, Haylee Allen, Justin Ulloa, Tristan Bock

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**CONTENTS**

[1 **EXECUTIVE SUMMARY** 3](#_Toc116667047)

[2 **INTRODUCTION** 3](#_Toc116667048)

[2.1 **Target Market** 4](#_Toc116667049)

[2.2 **Competitors** 4](#_Toc116667050)

[2.3 **Team Description** 5](#_Toc116667051)

[2.4 **Work Plan** 6](#_Toc116667052)

[3 **FUNCTIONAL REQUIREMENTS AND DESIGN** 6](#_Toc116667053)

[3.1 **User Interfaces** 7](#_Toc116667054)

[**3.2** **Hardware Requirements** 8](#_Toc116667055)

[3.3 **Software Interfaces** 8](#_Toc116667056)

[3.4 **Communication Interfaces** 9](#_Toc116667057)

[3.5 **Universal Design Elements** 9](#_Toc116667058)

[3.6 **Database Requirements** 9](#_Toc116667059)

[3.7 **Security** 9](#_Toc116667060)

[**4 WORKS CITED** 10](#_Toc116667061)

# **EXECUTIVE SUMMARY**

GradTrak is a web-embedded user interface for a university registrar to more clearly display a student’s progress toward completing their degree. This is similar to existing software like DegreeWorks, but it is not currently in use by CSUB, making it very difficult for a student to determine what courses are necessary to complete their goals in a timely fashion. Unlike DegreeWorks, which is closed source and sold as a service to universities, we plan for this to be Free and Open Source Software for any campus to use.

The team consists of Shadi Abdul Razzak, Haylee Allen, Justin Ulloa, and Tristan Bock, all students with senior standing at the California State University, Bakersfield. Tristan has several years of prior experience using DegreeWorks and is excited to help his fellows develop a solid competitor. He has prior experience working on a senior project at the University of California, Irvine, and plans to leverage that experience working with an even larger group here. Haylee has been working on front-end organization/design as of late and hopes to utilize her expanding knowledge to contribute to making the application’s envisioned design come to life. She is also currently enrolled in CMPS 3420 (Database Systems) and hopes to use what is learned via that class to assist in the database portion of the project. Justin has taken courses in both front-end development and back-end development here at CSUB, Web Programming 1 and Web Programming 2, and will use the knowledge and skills learned from these courses to help build and create an exceptional application that students will be able to benefit from in the future. He also taken Database Systems which will also aid in the development of the necessary functions that will be required for the overall state of the database. And last but not least, Shadi has taken Software Engineering as well as Database Systems at CSUB and is currently enrolled in Application Development and will put his best into creating the app he considers very important and crucial to students. He will use his experience and dedication to provide assistance in creating input fields for the front-end user interface and making it connect to database in the back-end, and help with application design.

# **INTRODUCTION**

This section contains information on the target market for the application that include why there is a market for the application. There is also a competitor’s section which goes over competitors in a similar market or our project scope and what things we hope to implement that would give us an edge over those competitors. As well as what our application aims to do better than ones that are in a similar scope. Lastly there is a team description and work plan section in which team qualifications and roles are explained which will help in the development in the project along with a rough draft of how the project will be split into sections and how long those sections are projected to take us to complete.

## **Target Market**

There are thousands upon thousands of students admitted to universities annually across the country, and not every school uses or can afford to use DegreeWorks or equivalent closed-source packages for their registrars. (citation) Due to this, students are offered with either an ineffective program or sometimes no program at all to efficiently help them track their degree progress. This is an issue because often times students do not have an efficient way to check their progression through their degree. Common issues are distinguishing between overlapping courses, such as ones that are required for a major but can also be considered as an elective for a major. Some programs offered to students are so outdated that they will show required courses as satisfying elective requirements, software as such only confuses the student.

## **Competitors**

There are a few preliminary things to note when it comes to competitors. The first thing to note is that open-source programs with a similar concept vary from university to university. Quite a few universities use their own programs which can be tricky for comparison if not enrolled in that particular university. The main edge our project plans to have over other similar programs is cost. We intend for our program to be free and accessible to everyone. With other programs they more than likely not are being paid for via the attending university. The thing is though, these programs are usually made inaccessible upon leaving the university or you have to wait till enrollment before you can access the features the program has to offer. This is not helpful for incoming students who want to get a gist of what is required of their selected degree program. With our goal to have a free program that is accessible to all, students would be able to see what coursework is required for their specific degree at universities before enrolling. They’d also be able to use this throughout the duration of their studies to keep track of what classes they’ve completed and how many courses and or units they need left to complete their degree. (Potentially will add citations/more information here).

## **Team Description**

Below we have included courses we have each taken as well as why those courses will contribute to the design and implementation of this project.

Table 1: What each person is doing and why they are qualified to do so

|  |  |  |
| --- | --- | --- |
| **Team Member** | **Experience** | **Role** |
| **Justin Ulloa** | CMPS 2680: Web Programming 1  CMPS 3680: Web Programming 2  CMPS 3420: Database Systems | Design and develop front and back-end of application and assist with database design |
| **Shadi Abdul Razzak** | CMPS 3350: Software Engineering  CMPS 3420: Database Systems  CMPS 3390: App. Development | Database input entries and assist with Application design |
| **Tristan Bock** | CS 122A: Intro Data Management (UCI)  ICS 169A/B: Senior Capstone Game Project (UCI)  CMPS 3350: Software Engineering | Flexible role, primarily focused on implementing the features of the database and front-end communication. |
| **Haylee Allen** | CMPS 2680: Web Programming 1  CMPS 3680: Web Programming 2  CMPS 3420: Database Systems | Assist with back-end and database implementation and design |

## **Work Plan**

Start of by designing the app how we want it to look like, and get it integrated with a database so we can start working on user login and more data inputs. Roles will later be assigned to team members as according to strong experience.

Table 2: Project Milestones

|  |  |  |  |
| --- | --- | --- | --- |
| **Milestone** | **Weeks** | **Goal** | **Team** |
| **Stride A** | 1-2 | Design and Build Database | Team (TBD) |
| **Stride B** | 1 | Front-end progress bar | Team (TBD) |
| **Stride C** | 1 | Front-end task completion | Team (TBD) |
| **Stride D** | 1-3 | Front-end “Still needed” | Team (TBD) |
| **Stride E** | 1 | Front-end link to catalog | Team (TBD) |
| **Stride F** | 1 | Front-end link to catalog of applicable courses | Team (TBD) |
| **Stride G** | 1 | Back-end testing database | Team (TBD) |
| **Stride H** | 1 | Ensure back-end pulls correct records from table | Team (TBD) |
| **Stride I** | 1 | Ensure back-end applies exceptions to records | Team (TBD) |
| **Stride J** | 1 | Ensure back-end displays correct information to front-end of application | Team (TBD) |

# **FUNCTIONAL REQUIREMENTS AND DESIGN**

There will be two primary components to this application: the database querying back-end that pulls a student’s records and the school’s catalog, and the presentation front-end that displays the information in a clear, concise way, that is suitable for either a student making their own plans or an advisor helping someone else

## **User Interfaces**

The User Interface will rather be straight to the point with a progress bar showing the students progress and how far along have they have completed college. We want to make it accessible as possible when inputting class information, so the add option will take you to a page where you can enter the custom information yourself.

Timeline

Description automatically generated

Figure 1: Example of DegreeWorks in which we are using as inspiration for the model of our application

Graphical user interface, text, application, email

Description automatically generated

Figure 2: Additional Example to correspond with Figure 1

## **Hardware Requirements**

As this is entirely a web-based application, there will be no hardware required for this project.

## **Software Interfaces**

The main thing with software interfaces that we are going to make sure of is that the application will be compatible with modern browsers (Google, Microsoft Edge, FireFox, etc.).

## **Communication Interfaces**

This application should not require any 2-way nor group communication among users. The application’s basic functionality is focused on each individual users’ choice degree, so this is something where there does not need to be an interface enabling cross communication between all users of the application. Each individual should be able to tailor their experience without the use of communication between other users.

## **Universal Design Elements**

In order to ensure that our application is accessible to as many people as possible, we will be sure to implement an array of features and standards. To begin, we will first be ensuring that the web facing side of the application has proper color schemes and contrast ratios. This will ensure that all users can concisely see and read text present. To do this we will make use of a web content accessibility guideline color contrast checker. This tool will allow us to input foreground and background colors and then test if the color combination passes accessibility standards [1]. We will use the tool to make sure not only the text present on the application is readable, but also so that any icons or infographics can be easily visible. The next thing is that we are going to make sure that any images present on the application are accompanied by a descriptive alt text so that if screen readers are used, they will be able to properly describe the image. We are also going to use concise and consistent fonts accompanied by applicable font sizes to increase the readability of the application by all. In order to avoid uneven spacing throughout the application, most if not all text will be aligned to the left to make sure that everything is even and easy for the eyes to navigate across.

## **Database Requirements**

We want our database to be precise with the information, meaning we will most likely be storing a lot of data at once into the database. For this reason, we want our database to be able to take such amount of information and declare it without conflict.

## **Security**

Our application will be using hashed passwords to prevent potential attackers from being able to gain access to a user’s account/personal information. We will also avoid possible SQL injection attacks by using prepared statements and creating queries and stored procedures that will have careful and proper parameterization.

# **4 WORKS CITED**

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| --- | --- |
| [1] | Accessible Web, "Web Accessibility Color Contrast Checker - Meet WCAG Conformance," n.d.. [Online]. Available: https://accessibleweb.com/color-contrast-checker/. [Accessed 14 October 2022]. |