

Title: Degree Compass

Background:

Each registration period, many students are made aware of scheduling errors they made several semesters ago that will impact their ability to take the courses they want.

Most classes have a set of prerequisites and corequisites, some are only offered during certain semesters, and some even require senior standing or other nonstandard requirements. It is nearly impossible to plan 8 semesters of courses without running into a scheduling error, and often these errors are discovered far too late. The Degree Compass team aims to provide a solution to this problem delivered via a web application that Mines students can use in order to plan several semesters into the future.

This project was originally born out of a Database Management course led by CS@Mines students, Eric McKeivitt, Roman Downie, and Brandon Barton. The original goal of the team was to streamline the process of planning for multiple semesters of classes in order to reduce the number of long-term scheduling errors that cost students extra semesters of enrollment. Over the course of the semester, the team showed a proof-of-concept website that integrated the Colorado School of Mines course catalog into a PostgreSQL Database (CSM's WebSQL). The website demonstrated capabilities for planning several semesters with a schedule validation algorithm that ensures each courses' prerequisite, corequisite, and other various constraints are satisfied.

This project was continued in the Summer Field Session for 5 weeks of additional development. Eric McKeivitt stood in as the client, while Brandon Barton and Roman Downie served as the development team. Over the 5 weeks, the team migrated the database from WebSQL to a cloud-based solution, Microsoft Azure. The team also worked on hosting a production instance of the website on PythonAnywhere, separate from the local development environment. In addition to this, the groundwork for future features and pages were planned and developed.

Project Goals:

The goal of this project is to prepare the website to be used by Mines students. This will include some of the following:

- Develop support for drafting multiple schedules in the "Schedule Workspace".
- Develop the "Explore Page", which will house features like exploring potential minors by seeing what additional classes would be required to obtain a particular minor.
- Improve the user interface of the website.
- Improve the schedule validation algorithm's performance.
- Add admin support for academic advisors, with additional relevant analytics.

- Work to improve security of the website.

Useful Skills/Technologies:

- Experience in Python
- SQL/PSQL
- Basic knowledge of HTML & CSS
- Experience with Python Flask framework is excellent, but not necessary

IP Rights will be shared by the client team and development team.

Student Team Benefits:

- Gain expertise in Full-Stack Software Engineering.
- Gain experience working with an existing codebase, as is common in the field.
- Opportunities for applications in network theory from the website's data.
- Develop a website that will benefit and be used by the Mines community.
- Work in a Test-Driven Development environment.

Team Size: 3-4 Students

Location: CSM Campus

Contact Information:

Eric McKevitt

emckevitt@mines.edu

[LinkedIn](#)

(972-979-5460)

Brandon Barton:

brandonbarton@mines.edu

(720-837-3047)

Roman Downie

romandownie@mines.edu

(720-290-0544)

Please feel free to contact any of the following client team members with any questions.