

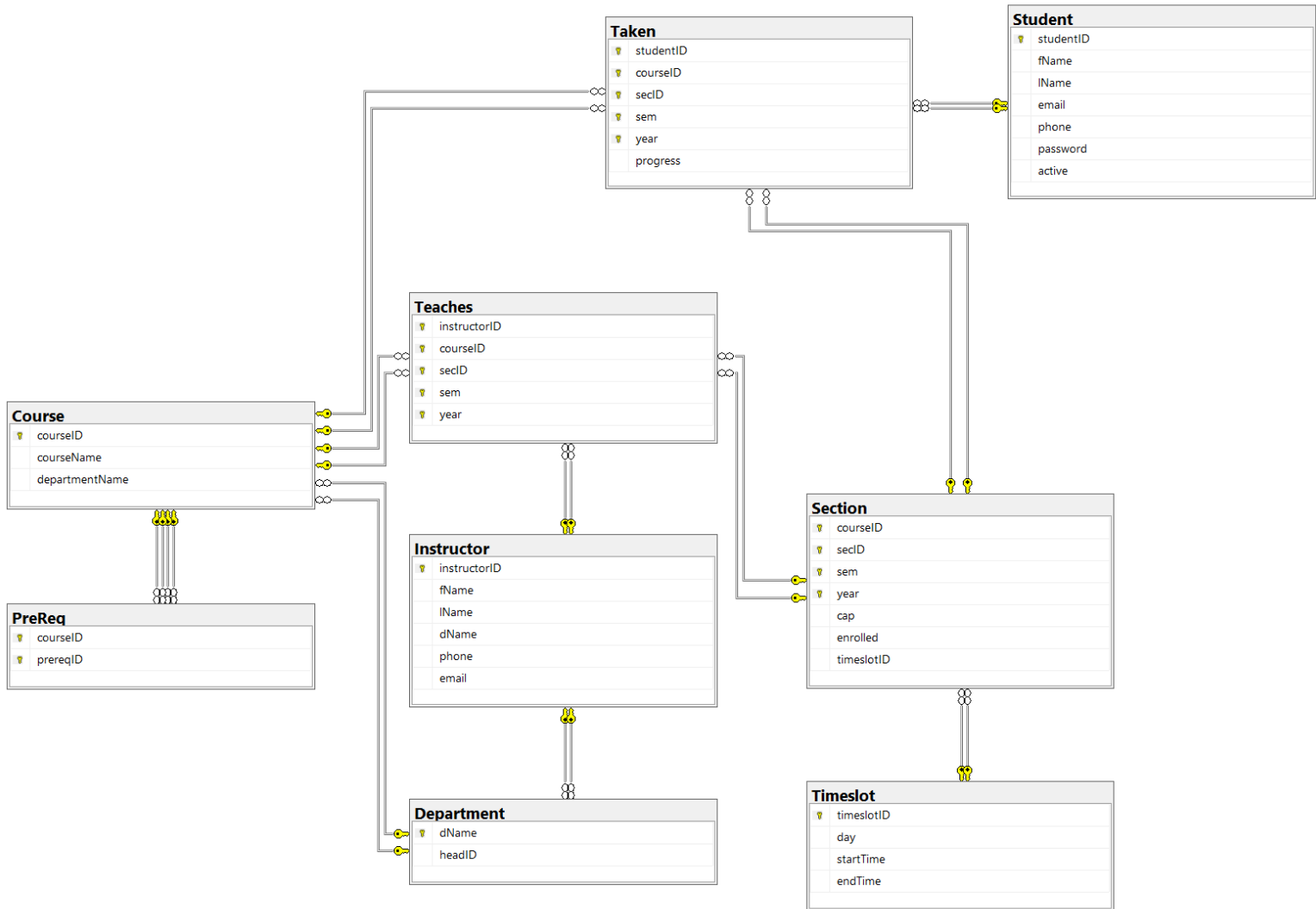
Introduction

The following is a brief description of our project's current design and implementation as of Wednesday, February 14th. Included is a diagram and description showcasing the database scheme and the reasons behind it, screenshots of our current systems, and the business rules implemented. This document will aim to explain core functionality and the major design choices that we decided on and the reasoning behind them.

Database Design

Our system revolves around the student use case, storing classes students have taken and displaying classes available based on prerequisites. Student information is stored in the Student table, where each individual is given a unique student ID that acts as their primary key as well as their login for our system and various fields for personal information. When a student searches for classes, the classes available are saved as a view reducing processing time if the student performs multiple queries. Each different course is stored in the Course table and given a unique course ID as a primary key, as well as a name, meeting time, and department. A course may also have any number of prerequisites stored in the PreReq table. With just the course and its prerequisite course ID both as primary keys referencing it, it is an efficient way to store many different prerequisites with just two fields. The classes a student takes are stored in the Taken table along with the course ID, section ID, and the year and semester they took it. This allows for the creation of views for referencing prerequisites faster when attempting to apply to multiple courses. The section of each course stores the semester and year that the instance of the course taking place, as well as the number of students currently enrolled and the maximum number of students allowed in that section. This separates some data from the course table to reduce search time when that information is not needed. The department just holds a department ID, allowing both one-to-one and many-to-one relationships for the head and members of the department, respectively. These design choices help keep our system responsive even with a large number of entries or when executing complex queries.

Schema Diagram



Database Scheme Description

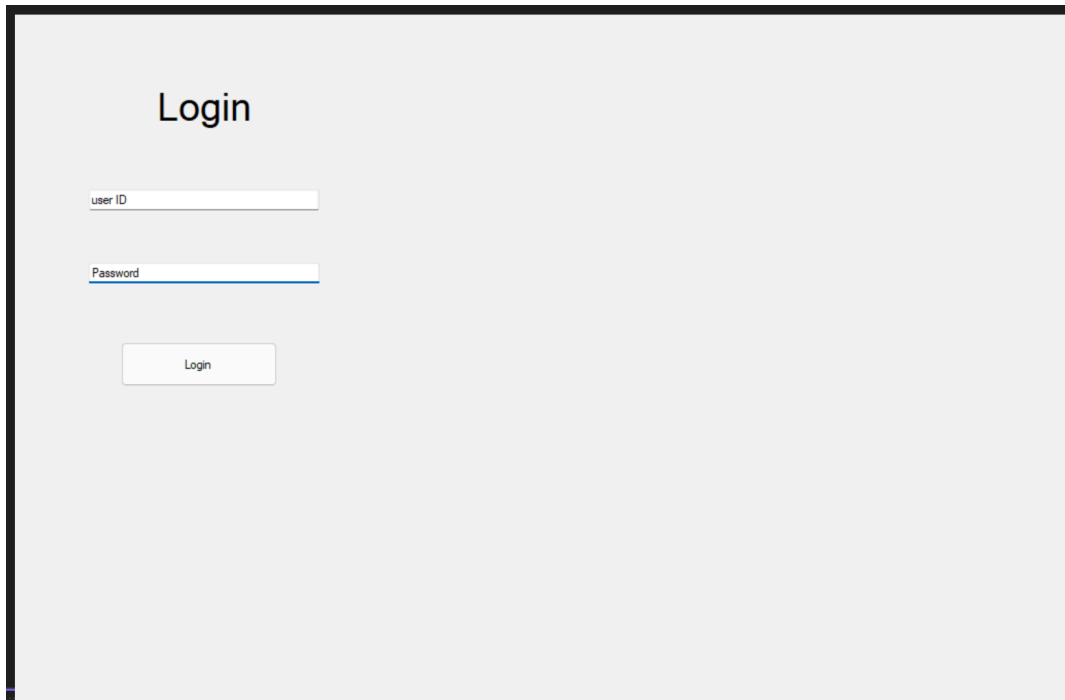
Our database is designed to manage and track students' academic journeys. The primary entities include:

- **Students:** Identified by a unique ID, this table contains personal details and serves as their system login credentials.
- **Courses:** Each course has a unique ID, name, schedule, and department affiliation.
- **Prerequisites:** This table maps courses to their required prerequisites using course IDs.
- **Taken Courses:** Records the courses students have completed along with the term details.
- **Course Sections:** Details of each course offering, including semester, enrollment count, and capacity.
- **Instructors:** Information about the faculty, including those teaching specific course sections.

The reason behind our design is to make sure that finding information is fast and easy. This helps everyone get to details about when courses are offered, student details, and what classes you need to take before others, without any hassle.

System Screens

Login Page



Login

user ID

Password

Login

Allows the user to log in to their unique account using their student ID and password

Profile Page

fLowLayoutPanel1.Show();

EXIT

Profile

Class Search

Cart

Enrolled Classes

LOG OUT

First Name: Eric

Last Name: Carstensen

Email: e@mail.com

Phone Number: 123-456-7890

Password:

Disolav Update

Shows information stored on each student's account and allows users to edit values.

Class Search page

EXIT

Profile

Class Search

Cart

Enrolled Classes

LOG OUT

Search for Classes

psyc Search

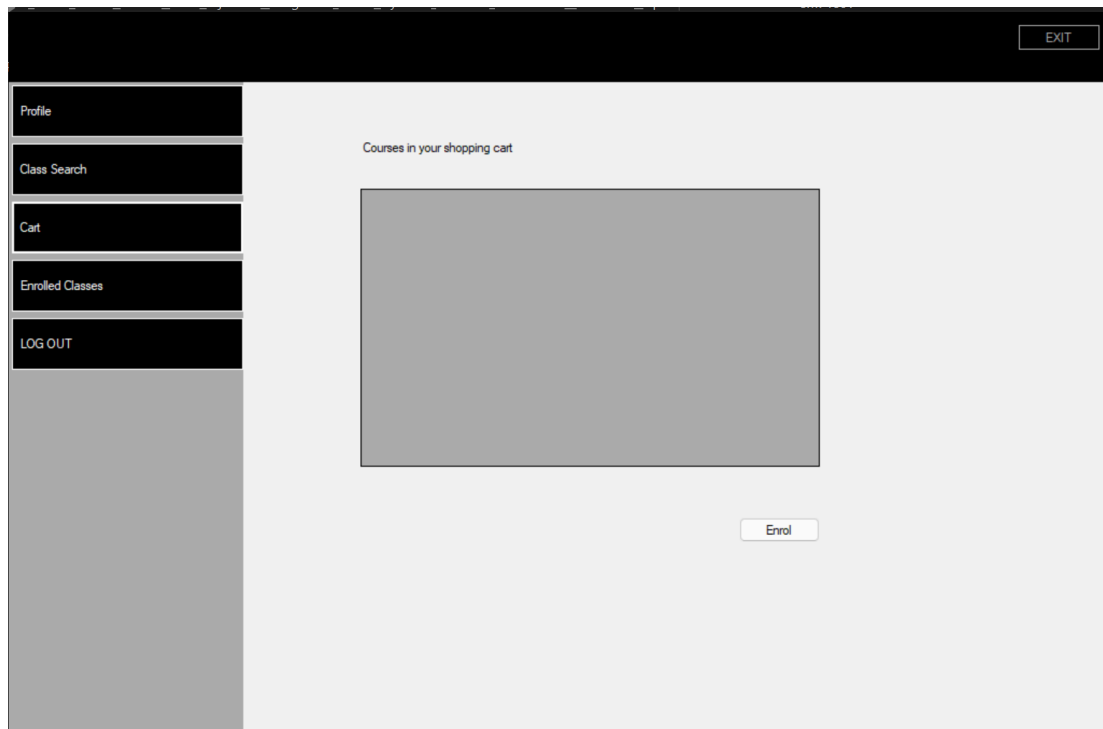
FALL 2022 Add To Cart

Semester Year

	courseID	courseName	secID	sem	year	cap	enrolled	
	435	Intro to Psychology	0	Fall	2022	40	0	
▶	435	Intro to Psychology	1	Fall	2022	80	0	F
	435	Intro to Psychology	2	Fall	2022	40	0	
	435	Intro to Psychology	3	Fall	2022	80	0	
	435	Intro to Psychology	4	Fall	2022	200	0	V
	434	Essentials of Psy...	0	Fall	2022	40	0	V
	434	Essentials of Psy...	1	Fall	2022	80	0	V
	434	Essentials of Psy...	2	Fall	2022	80	0	1
	434	Essentials of Psy...	3	Fall	2022	20	0	F
	434	Essentials of Psy...	4	Fall	2022	40	0	
	430	Advanced Psych...	0	Fall	2022	80	0	F

Allows the user to search for available classes by semester, year, and keyword. Displays all available classes and relevant information. Checks prerequisites and time conflicts.

Shopping Cart Page



Displays all courses currently within users' shopping carts. Allows users to confirm and enroll in the course. Checks capacity and increments the number enrolled.

Enrolled Classes Page

	courseID	courseName	sem	year	secID	day	start Time	end
▶	3	Advanced Biology	Summer	2023	1	Friday	12:30:00	14:2
	44	Intro to Chemistry	Summer	2023	1	Monday	17:00:00	17:5
	46	Essentials of Com...	Summer	2023	2	Tuesday	12:00:00	13:5
	84	Fundamentals of ...	Summer	2023	3	Monday	17:50:00	19:1
	88	Essentials of Mat...	Summer	2023	2	Wednesday	17:00:00	18:5
*								

Displays all courses the user is successfully enrolled in. Allows users to filter by semester and year.

These visuals represent the current state of our system's user interface, displaying how users interact with the database to retrieve or input information to complete various tasks.

Business Rules

Our system follows these simple rules:

- Stored Procedures should be implemented at the database level
- Transactions should be used when accessing the database, allowing a full rollback on error
- Metalized views should be used at the database level.
- Every student gets a unique ID that nobody else has. They can sign up for many classes.
- Some classes require you to finish other classes first before you can take them.
- Teachers can lead several class groups, but each group has just one teacher.
- Each section has a limit on how many students can join, and it can't be more than that.
- Many instructors can work in a department, but an instructor can work only in one department.
- Each department has a head, and an instructor can be the head of only one department.

Conclusion

This document outlines the foundational aspects of our system, designed to streamline the academic management process for students and faculty alike. Our database scheme is constructed to support efficient querying, ensuring that our system is responsive with a large amount of data and concurrent users.