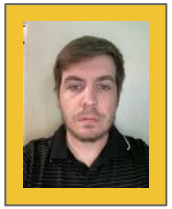
Curriculum and Instruction Doctoral Tracker DR3

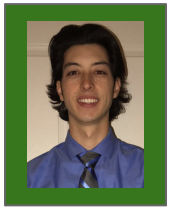
Team What's Up Doc

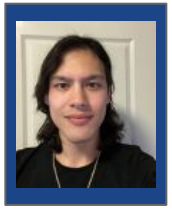
Introduction

Meet the Team:

- Adam Larson
  - Team Lead, connections and back end developer
- Brandon Shaffer
  - Repo manager, chief editor, front end developer
- Eddie Lipan
  - Front end developer
- Special thanks to mentor Daniel and CS Faculty Member Dr. Michael Leverington







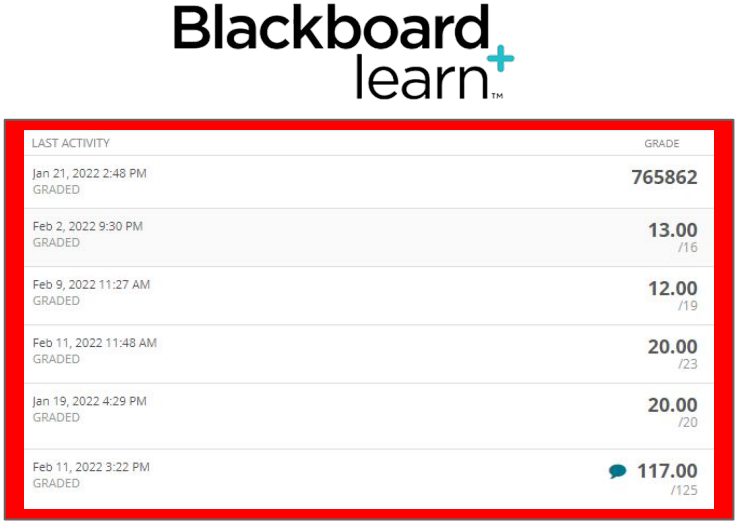
Meet the Client:

- Dr. Gretchen McAllister, Ph.D., Coordinator of the NAU Curriculum and Instruction (C&I) doctoral program
  - Aided by Michele Benedict, Administrative Services Assistant

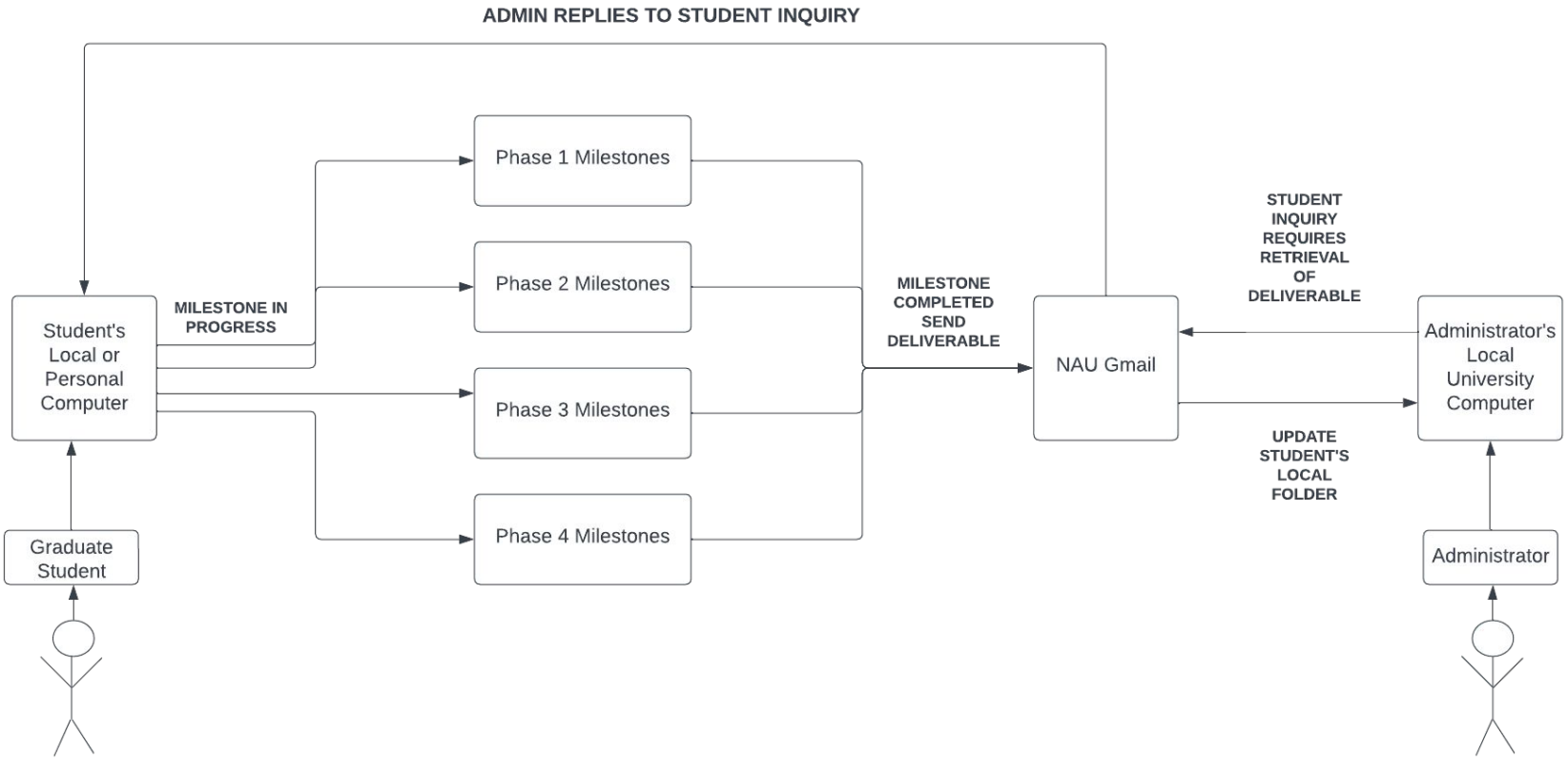
Problem Statement

As of Fall 2020, **3.1 million graduate students** attended universities across the United States. [1]

- **Learning Management Systems** (LMS) such as **Blackboard Learn** or **Canvas** are generally used to manage undergraduate classwork and grades.
- As graduate work becomes less quantifiable, managing and tracking the program through a standard LMS becomes less feasible.
- The NAU C&I doctoral program's current workflow is inefficient. Workflow outlined on next slide.



[1] National Center for Education Statistics - Postbaccalaureate Enrollment



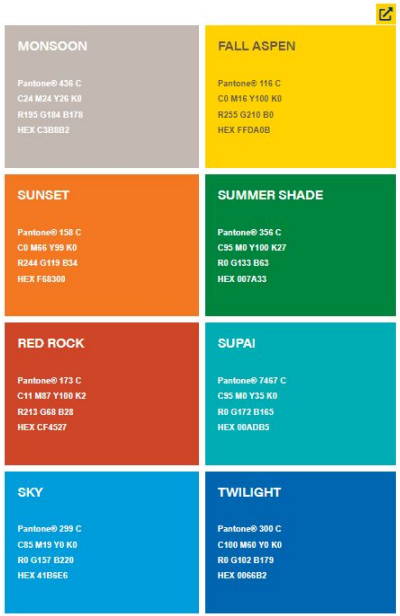
Current C&I Doctoral Program Workflow

Solution Overview

- Organization
  - Student
  - Categories
- Searchable
  - Administration tool
- Student Access
  - Progress Tracker
- Redundancy
  - Backups

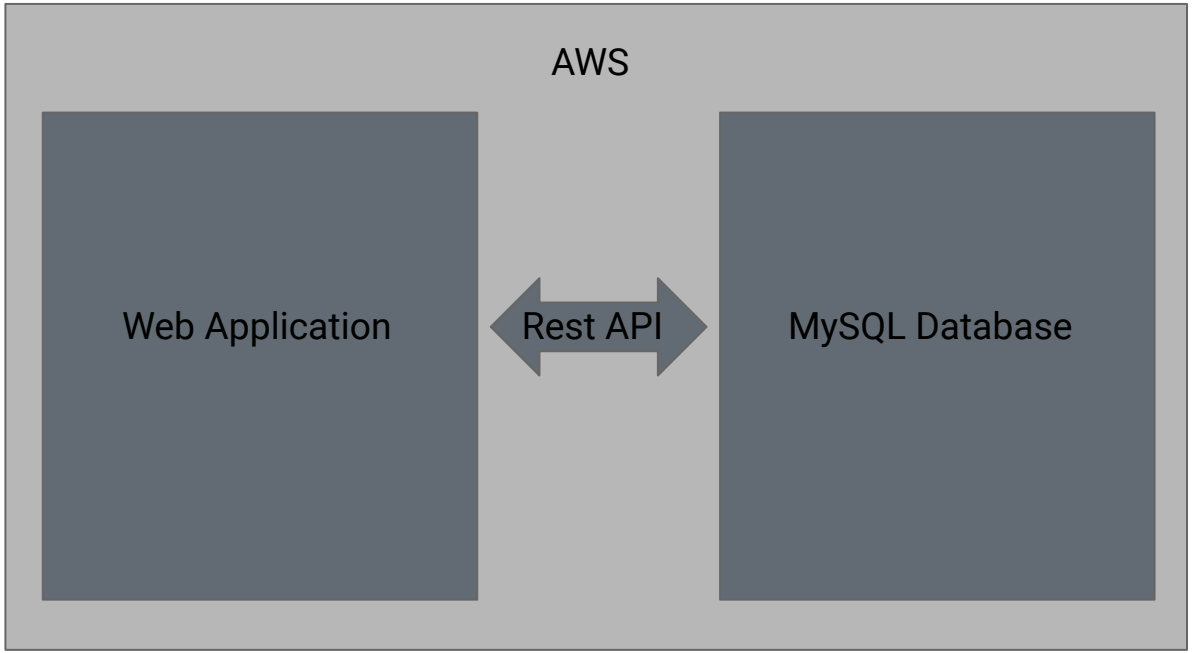
Requirements/Specifications Review

- Database for student files
- Two levels of access
  - Student
  - Faculty
- Web application
  - Database upload/download
  - Statistical Data
- NAU Colors
- Accessibility



Architecture Review

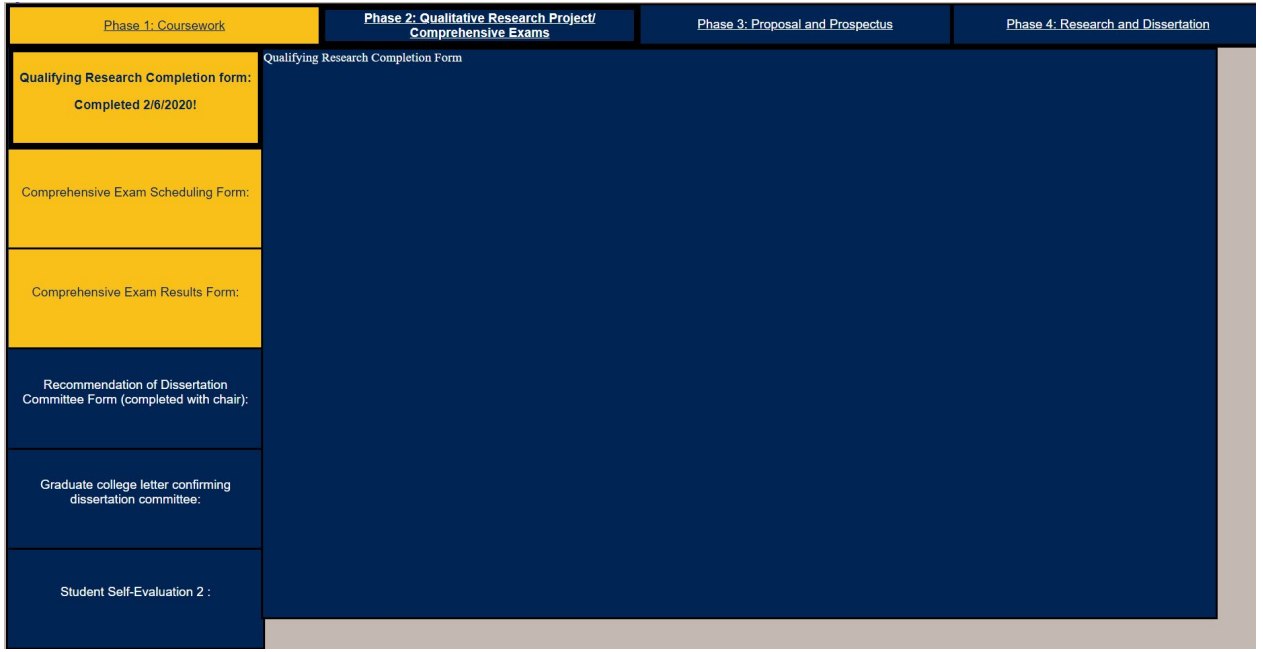
- Front-End
  - HTML Pages
  - CSS styling
  - JavaScript functionality
- Back-End
  - MySQL database
  - Rest API interaction
  - AWS server host



Implementation Details

Web App

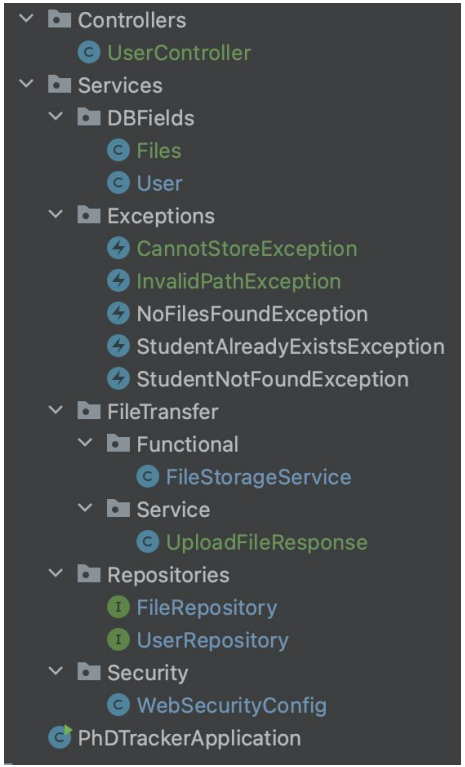
- HTML/CSS/JS
- Updates Dynamically
- Menu on left changes as files are uploaded
- Doctoral phases on top change as menu completes
- Large area is a preview placeholder



Implementation Details

Rest API

- Spring Boot Java Framework
- Creates endpoints for web requests to send and receive data
- Data connectivity
  - Spring JPA (Java Persistence API) module
  - Automated SQL requests through a CRUD (create, read, update, delete) or JPA repository interface
- Security
  - Spring Security Module
  - Industry standard OAuth2 connections
  - Easily configured policy for endpoint data retrieval
  - SSL Certificate used for encryption from client to server and server to database

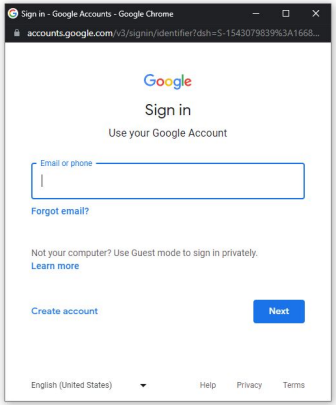


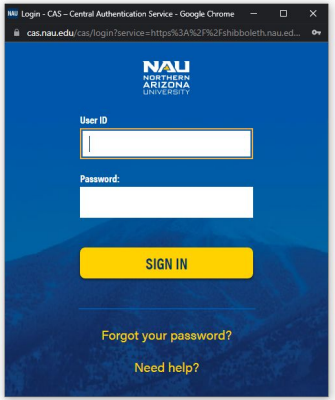
Implementation Details

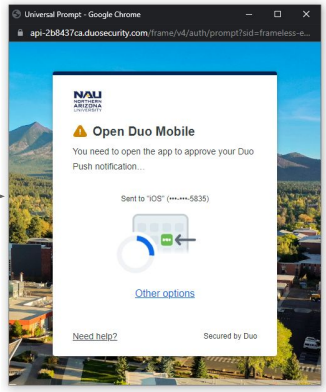
Database

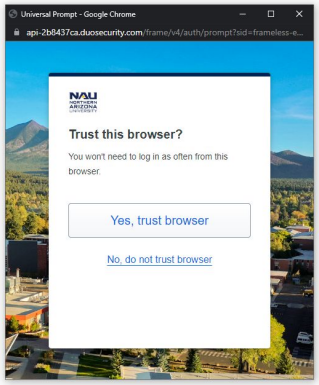
- MySQL
- Two tables
  - User table holds general student/admin information and status
  - File table stores file data and user connections

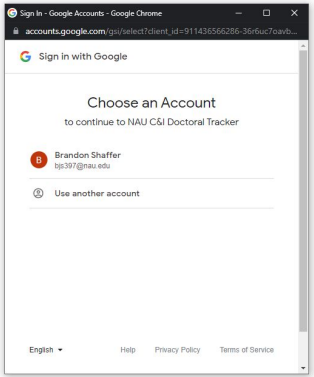
```
mysql> describe capstone.user;
+------------+--------------+------+-----+---------+----------------+
| Field      | Type         | Null | Key | Default | Extra          |
+------------+--------------+------+-----+---------+----------------+
| userNo     | int          | NO   | PRI | NULL    | auto_increment |
| userID     | varchar(255) | NO   |     | NULL    |                |
| first_name | varchar(255) | NO   |     | NULL    |                |
| last_name  | varchar(255) | NO   |     | NULL    |                |
| admin      | tinyint(1)   | YES  |     | 0       |                |
+------------+--------------+------+-----+---------+----------------+
5 rows in set (0.00 sec)

mysql> describe capstone.files;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| uploadID    | varchar(36)  | NO   | PRI | NULL    |       |
| filename    | varchar(256) | YES  |     | NULL    |       |
| filetype    | varchar(256) | YES  |     | NULL    |       |
| data        | longblob     | YES  |     | NULL    |       |
| upload_time | varchar(100) | YES  |     | NULL    |       |
| userID      | varchar(50)  | YES  | MUL | NULL    |       |
| uploaded_as | varchar(100) | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
7 rows in set (0.00 sec)
```



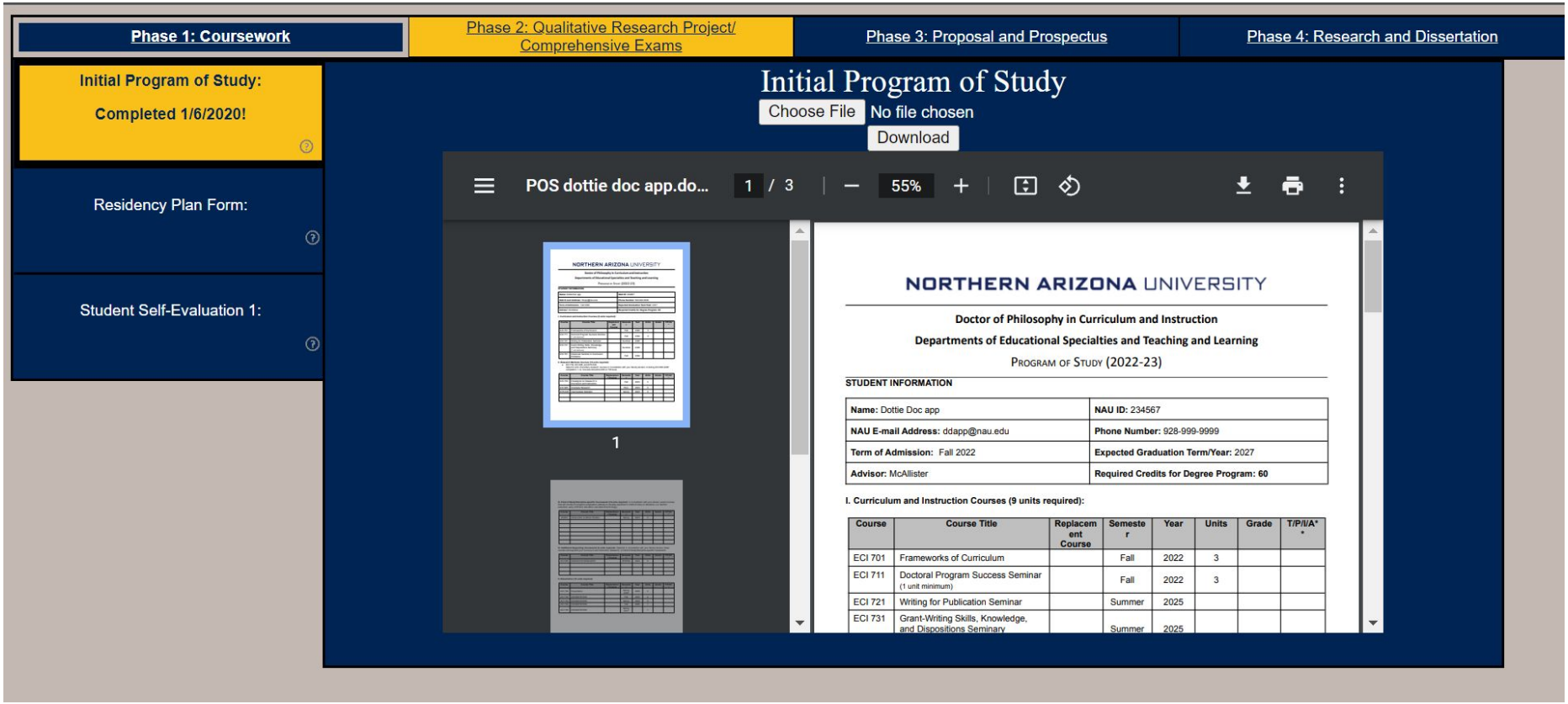




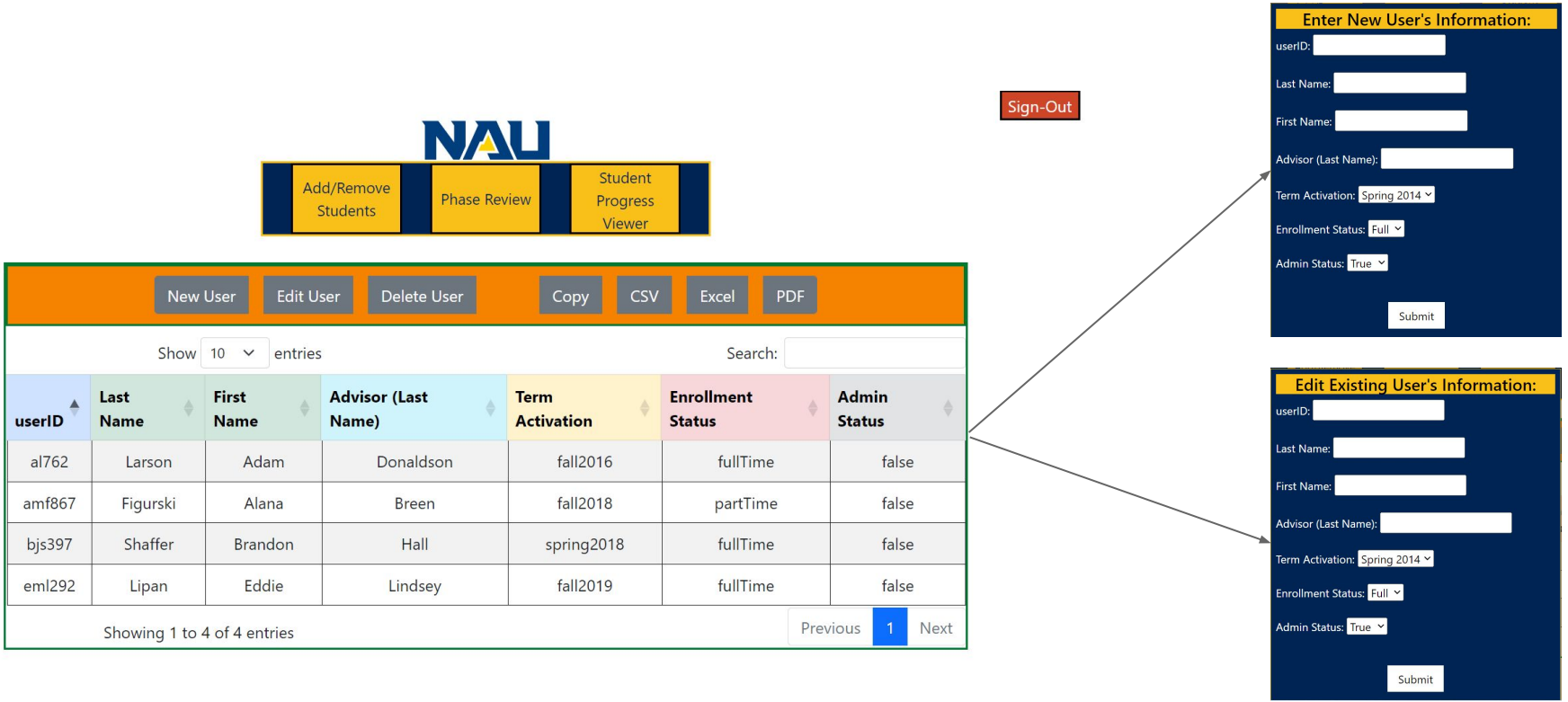




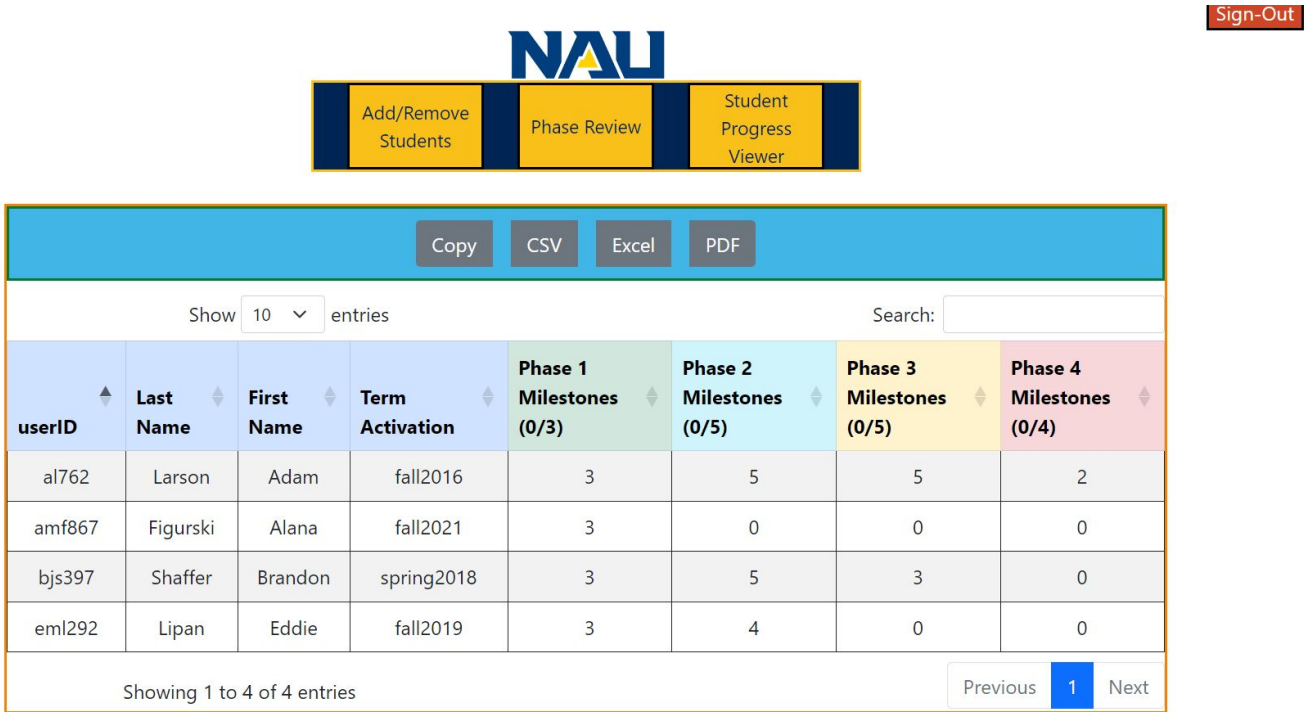
Prototype Review – Landing Page



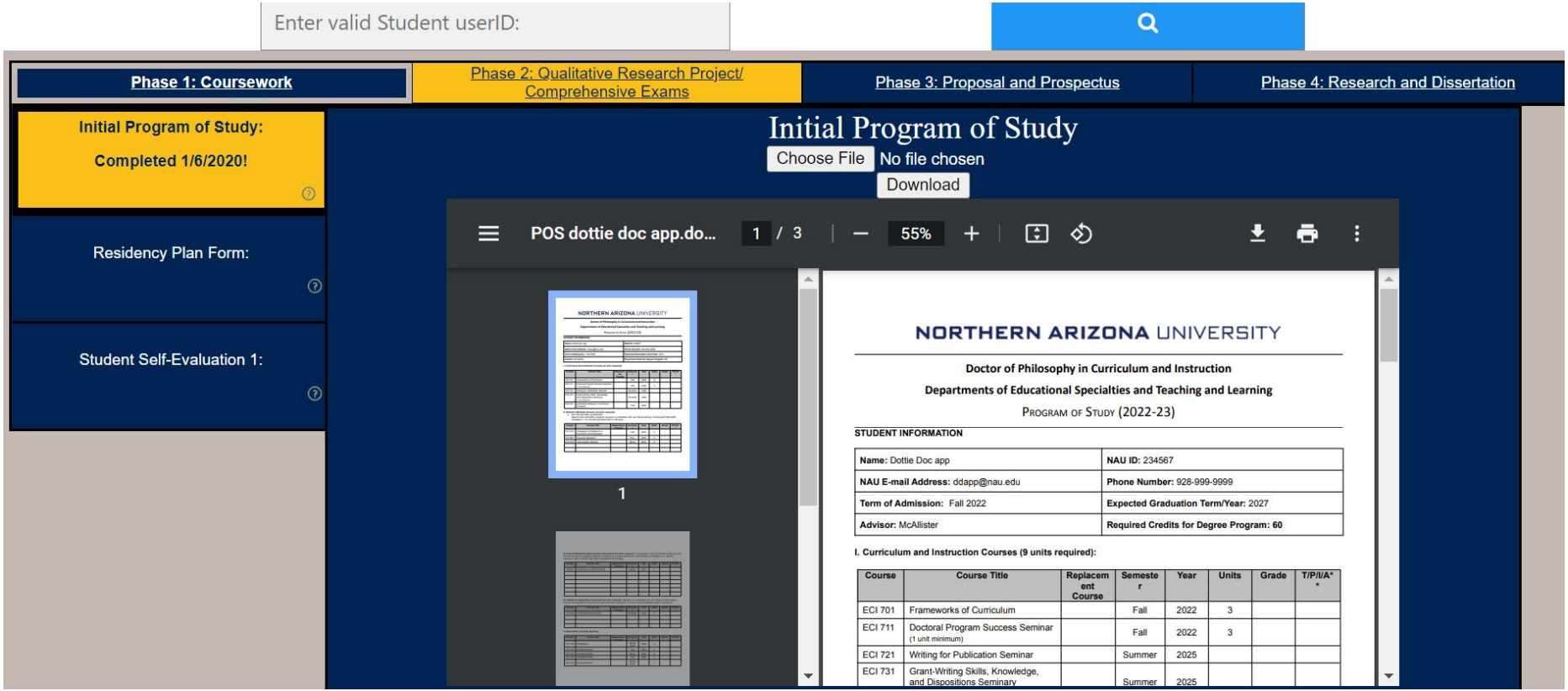
Prototype Review – Student Home Page



Prototype Review – Admin Home Page



Prototype Review – Admin Home Page



Prototype Review - Admin Home Page

Challenges and Resolutions

Primary

- ITS Assistance
  - Resolution: None yet
  - Waiting for direction and sourcing options outside of school
- Technology
  - Resolution: Lots of research
  - Numerous tutorials, videos, and trial and error
  - Some commercial assistance

Secondary Challenges

- Maintaining requirements
  - Resolution: Limits on what we can do in remaining time
  - Many changing requests and additional desired functions or student feedback
- Client scheduling
  - Resolution: Accommodate as much as possible
  - Two effective clients working together makes scheduling more challenging
  - Meet when possible, even if one person isn't available

Testing Plan

Website

- Manual
- Testing website as features are implemented and connected
- Cons - Slow and can be inconsistent

Server

- Java Based
- Uses the Spring framework and JUnit5
- Tests are automated and available for all functionality - end-points, DB connection, auto-mailer, etc.

Database

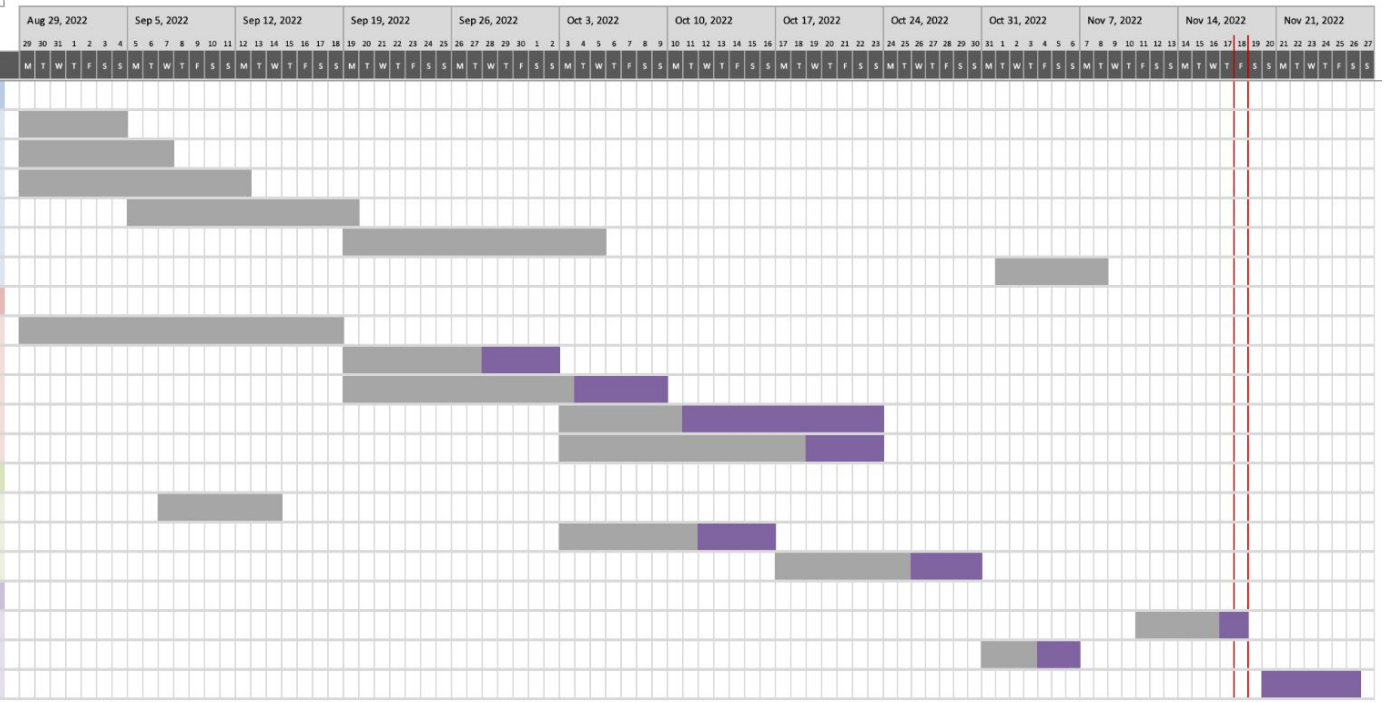
- Test method is manual - returned data is confirmed through Java tests
- MySQL tests seem to be manual or set up by personal script
    - Creates additional overhead for testing our very light database use

Schedule

Team Members:
Adam Larson, Brandon Shaffer, Eddie Lipan

Project Start: Sun, 8/28/2022
Display Week: 1

TASK	ASSIGNED TO	PROGRESS	START	END
Backend Operations				
Create Databases	Adam	100%	8/28/22	9/4/22
Initialize REST API	Adam	100%	8/28/22	9/7/22
API End Points	Adam	100%	8/28/22	9/12/22
API Security Policies	Adam	100%	9/5/22	9/19/22
API/DB File Storage	Adam	100%	9/19/22	10/5/22
Email Response	Adam	100%	11/1/22	11/8/22
Front End Operations				
Initialize Website	Eddie	100%	8/29/22	9/18/22
Set Up Login System	Brandon/Adam	70%	9/19/22	10/2/22
Add Menu and Format	Eddie	75%	9/19/22	10/9/22
API Connection	Eddie/Brandon	40%	10/3/22	10/23/22
Data Display Pages	Brandon/Eddie	80%	10/3/22	10/23/22
Account				
Google Security Policy	Adam	100%	9/7/22	9/14/22
Google API connection	Adam/Brandon	70%	10/3/22	10/16/22
Data Filtering	Adam	70%	10/17/22	10/30/22
Finalization				
API/DB Testing	Adam	80%	11/11/22	11/18/22
Web App Testing	Brandon/Eddie	60%	10/31/22	11/6/22
Full Deployment	Adam/Brandon/Eddie	0%	11/20/22	11/27/22



Conclusion

Team What's Up Doc is delivering an intuitive tracker, as a website application, to the NAU C&I doctoral program that will:

- Adhere to proper COE authentication and authorization
- Relieve administrators from data entry and acquisition duties
- Allow graduate students to track their progress through the graduate program