WCU

WEST CHESTER UNIVERSITY

CSDEGREENAVIGATOR

Helping WCU CS students visualize and plan their path to graduation

CONTRIBUTORS

Front End

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- Tobyn Sitar
- Yanxi Wei

Back End

- Robert Silver
- Justin Kerr
- Drew Stephens

AGENDA

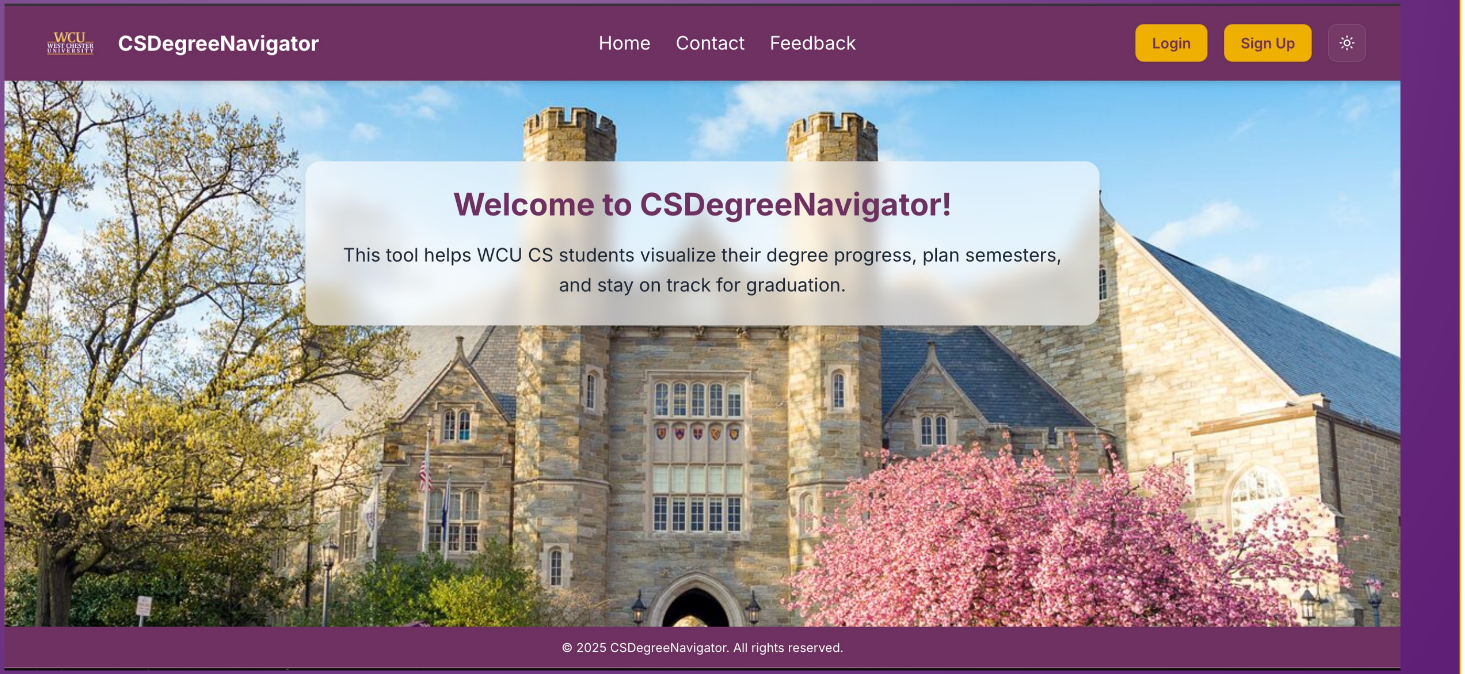
- Project Overview / Client Expectations
- UI & UX Improvements
- Achieving Client Expectations
- User Usability Study
- Future of CSDegreeNavigator
- Client Impressions
- What We Learned
- Conclusion

OVERVIEW/ CLIENT EXPECTATIONS

- Client: Dr. Linh Ngo
- Overview:
  - Dr. Ngo originally wanted a way for students to recommend course schedules based on time restrictions.
  - With a focus on user interaction, our client insisted for a flexible and interactive course planner instead to allow students to drag & drop courses.
- Key Aspects
  - Usability
  - Display degree progress
  - Easy to understand
  - Flexible for new/current students at West Chester

UI & UX IMPROVEMENTS

- UI and user experience design focus
- Making the website more consistent and easier to use
- Overview of key updates



Welcome to CSDegreeNavigator!

This tool helps WCU CS students visualize their degree progress, plan semesters, and stay on track for graduation.

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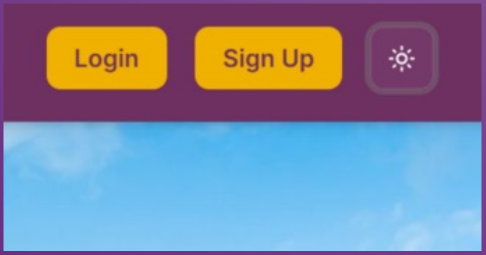
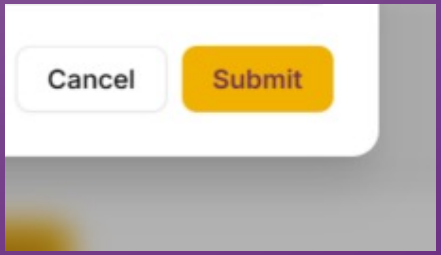
BUTTON STYLING AND BRANDING CONSISTENCY

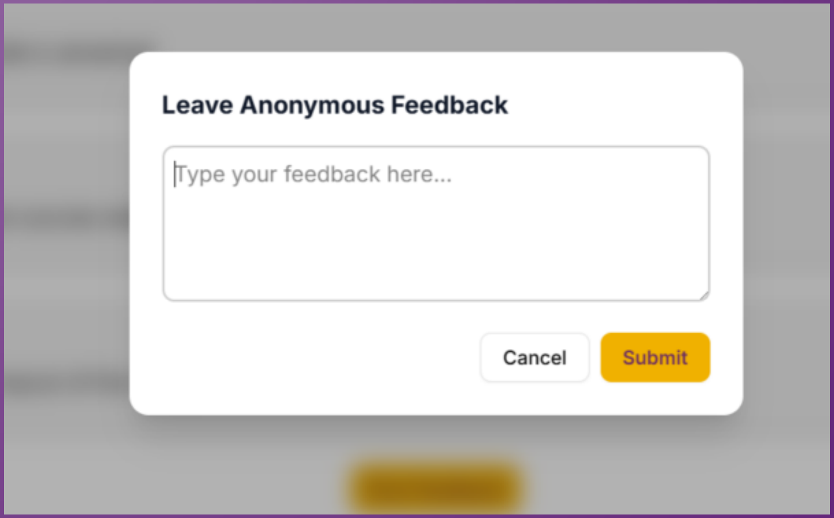
- Updated button styling across the website
- Gold background with purple text (WCUPA colors)
- Make the interface look cleaner and more consistent with the university's branding





ANONYMOUS FEEDBACK POPUP MODAL

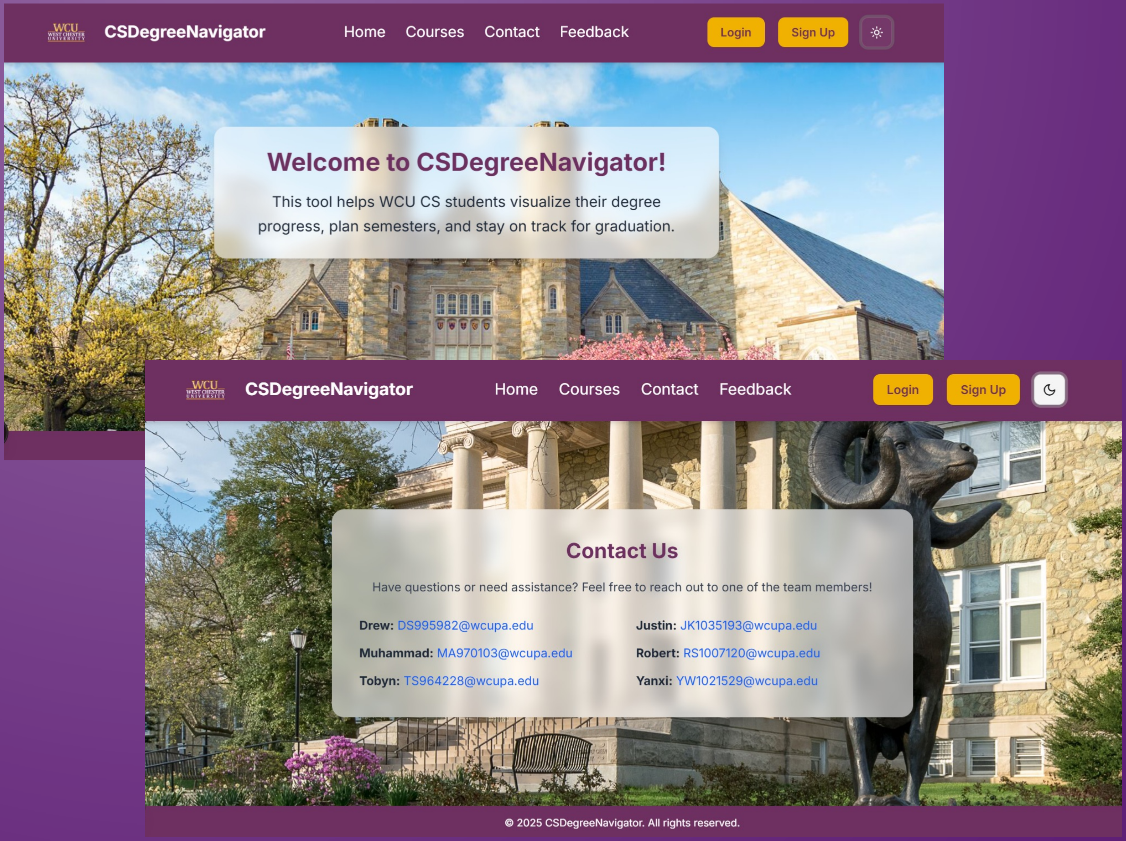
- Added a popup modal for the anonymous feedback form
- Users can open the form in a modal window with a blurred background
- This makes the feedback experience feel smoother and helps users focus more on what they're writing



Leave Anonymous Feedback

HOME AND CONTACT PAGE REDESIGN

- Redesigned Home and Contact pages using full-width background images
- With centered overlay text and information cards
- This gives a stronger first impression and makes the website feel more welcoming and professional



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This tool helps WCU CS students visualize their degree progress, plan semesters, and stay on track for graduation.

Contact Us

Have questions or need assistance? Feel free to reach out to one of the team members!

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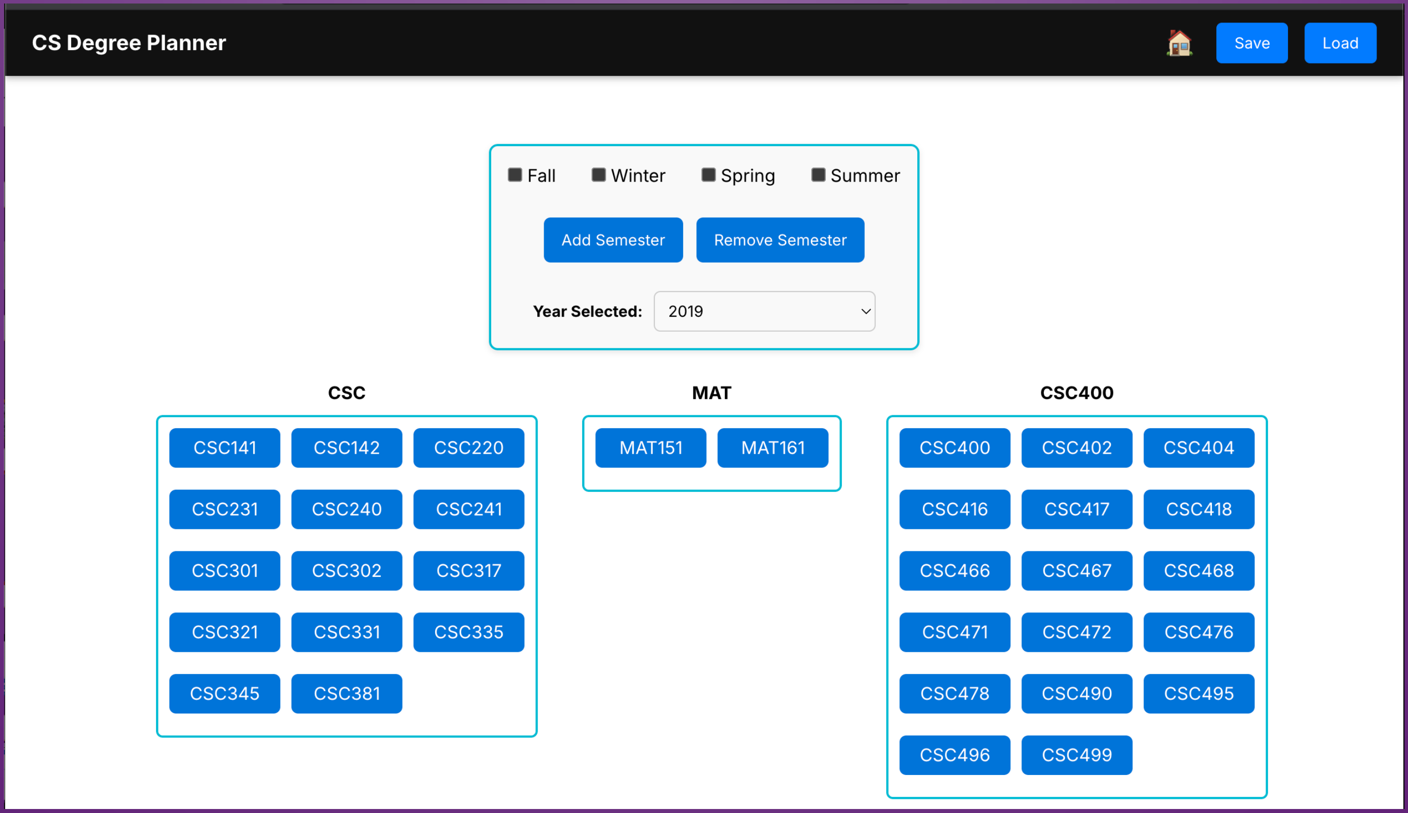
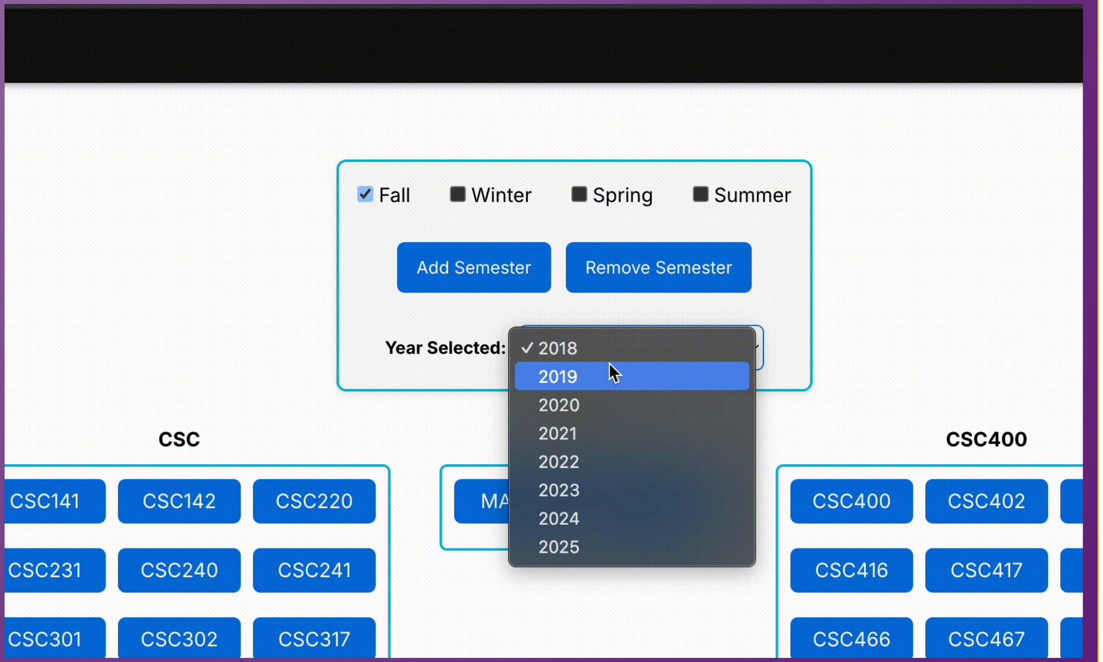
CS DEGREE COURSE PLANNER



Year Selected: 2019

POPULATING COLUMNS / ADDING COURSES

- A student can add a semester based on the season and year dropdown.
- This allows a user to have control over which columns they want to work on.
- A user can add a semester and remove a semester by selecting the options.
- Automatically keeps semesters in sequential order and prevents duplicates.

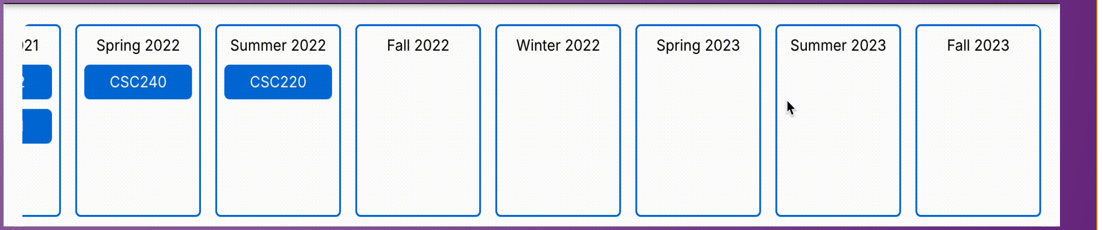


☑ Fall ■ Winter ■ Spring ■ Summer

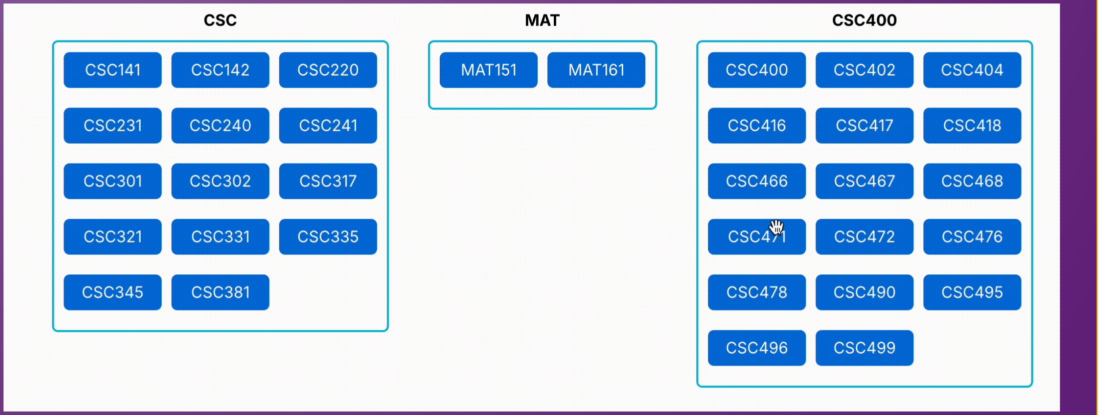
Year Selected: ✓ 2018

HORIZONTAL SCROLLING

- To maintain multiple semester columns, we added horizontal scrolling.
- Keeps all the semesters accessible on one screen while being space efficient
- Sliding is also a feature for the course list, giving us the same advantages



21	Spring 2022	Summer 2022	Fall 2022	Winter 2022	Spring 2023	Summer 2023	Fall 2023
	CSC240	CSC220					



CSC

CSC141 CSC142 CSC220
CSC231 CSC240 CSC241
CSC301 CSC302 CSC317
CSC321 CSC331 CSC335
CSC345 CSC381

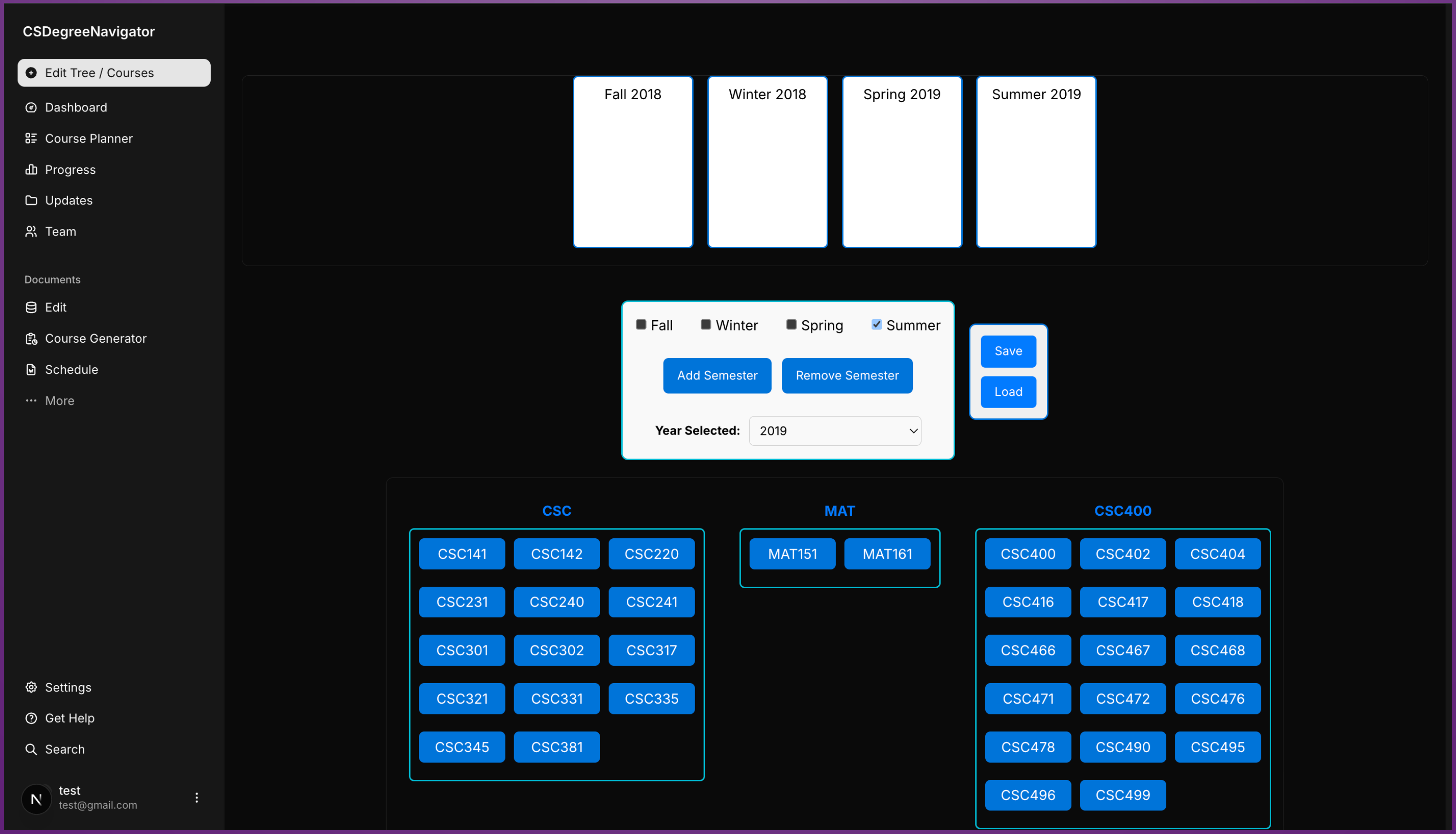
MAT

MAT151 MAT161

CSC400

CSC400 CSC402 CSC404
CSC416 CSC417 CSC418
CSC466 CSC467 CSC468
CSC471 CSC472 CSC476
CSC478 CSC490 CSC495
CSC496 CSC499

DASHBOARD INTEGRATION



CSDegreeNavigator

- Edit Tree / Courses
- Dashboard
- Course Planner
- Progress
- Updates
- Team

Documents

- Edit
- Course Generator
- Schedule
- More

- Settings
- Get Help
- Search

test
test@gmail.com

Fall 2018

Winter 2018

Spring 2019

Summer 2019

□ Fall □ Winter □ Spring ☑ Summer

Add Semester | Remove Semester

Year Selected: 2019

Save

Load

CSC

CSC141 CSC142 CSC220
CSC231 CSC240 CSC241
CSC301 CSC302 CSC317
CSC321 CSC331 CSC335
CSC345 CSC381

MAT

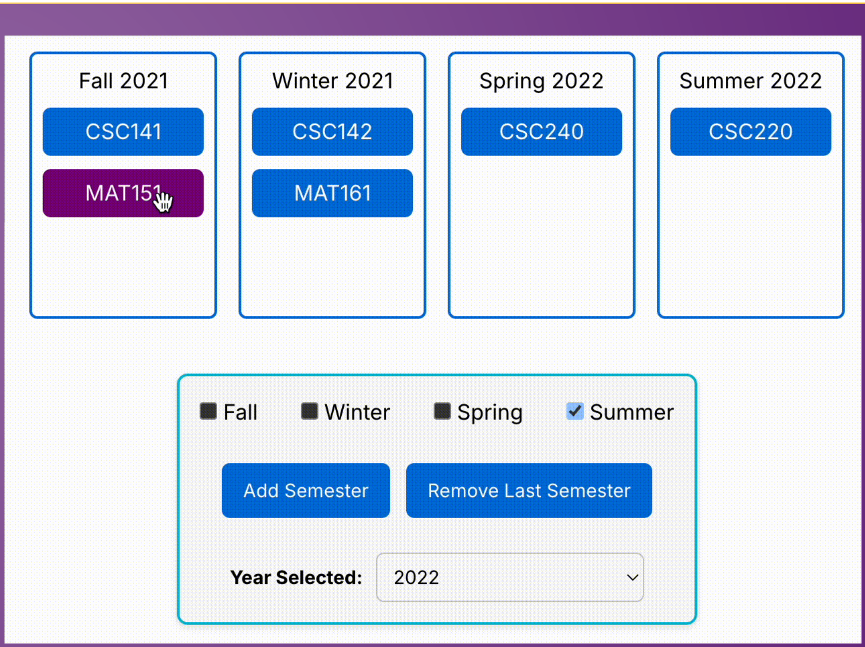
MAT151 MAT161

CSC400

CSC400 CSC402 CSC404
CSC416 CSC417 CSC418
CSC466 CSC467 CSC468
CSC471 CSC472 CSC476
CSC478 CSC490 CSC495
CSC496 CSC499

MANAGING PREREQUISITES

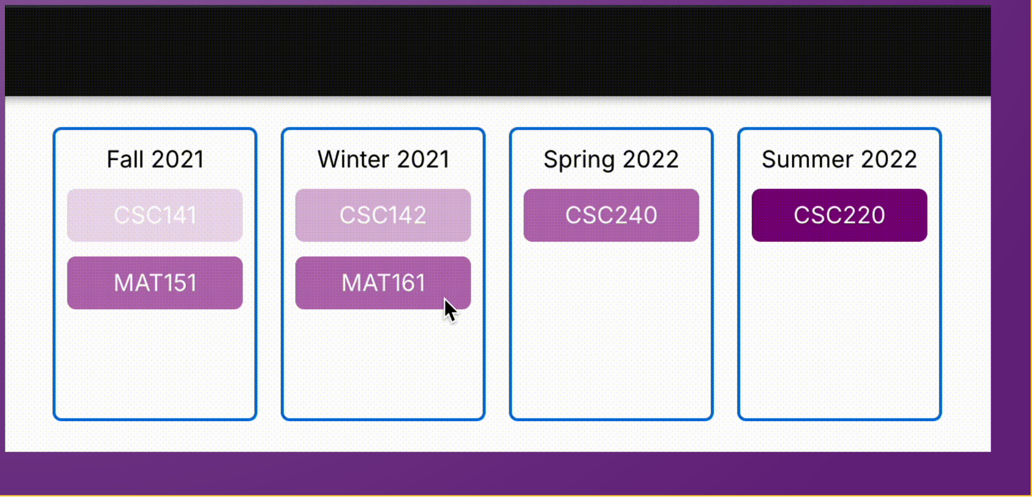
- To visualize required courses, we added two functionalities.
- Firstly, once a course is clicked, it highlights prerequisites recursively.
  - Differentiates prerequisite distance based on opacity.
- Secondly, a course cannot be moved into a semester that violates the prerequisite sequence
  - In other words, course A cannot be taken at the same time or before it's prerequisite course B, nor can it be taken at the same time or after the course it is a prerequisite of, course C



Fall 2021	Winter 2021	Spring 2022	Summer 2022
CSC141	CSC142	CSC240	CSC220
MAT151	MAT161		

■ Fall ■ Winter ■ Spring ☑ Summer

Year Selected: 2022



Fall 2021	Winter 2021	Spring 2022	Summer 2022
CSC141	CSC142	CSC240	CSC220
MAT151	MAT161		

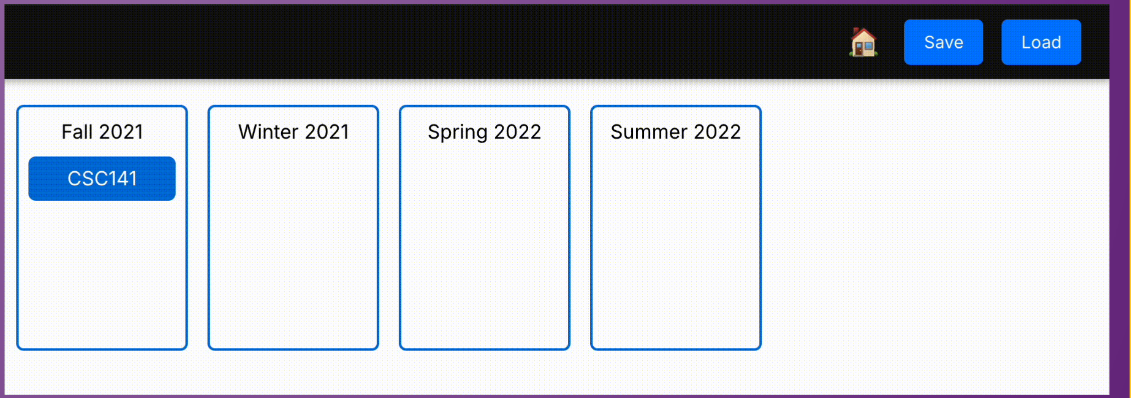
SAVING & LOADING DATA

Why Save and Load Data?

- Allow students to **continue** planning without losing progress.
- Enable flexible updates to academic plans over time.

Behind the Scenes

- Upon login, user data is **automatically loaded** from MongoDB.
- Empty columns are **filtered out** when reloading to keep the planner clean.



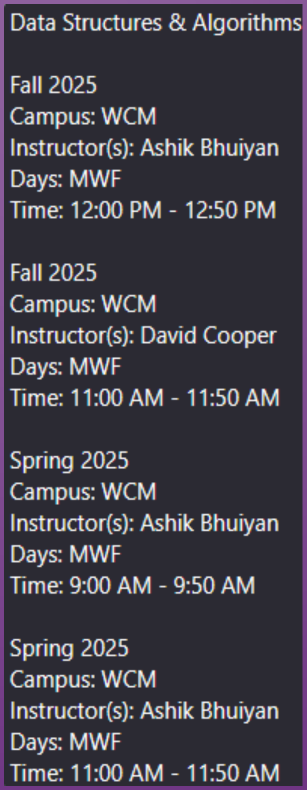
COURSE MEETING TIMES - TOOLTIP

Key Features

- Hovering over a course displays real-time information:
- Available meeting times
- List of instructors
- Semester availability (Spring 2025, Fall 2025)

Benefits

- Instant information — No need to switch pages
- Smarter scheduling — Helps users choose courses based on preferred professors or times
- Enhanced interactivity — Strengthens user engagement with planner



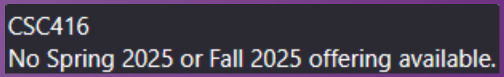
Data Structures & Algorithms

Fall 2025
Campus: WCM
Instructor(s): Ashik Bhuiyan
Days: MWF
Time: 12:00 PM - 12:50 PM

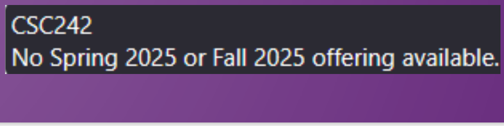
Fall 2025
Campus: WCM
Instructor(s): David Cooper
Days: MWF
Time: 11:00 AM - 11:50 AM

Spring 2025
Campus: WCM
Instructor(s): Ashik Bhuiyan
Days: MWF
Time: 9:00 AM - 9:50 AM

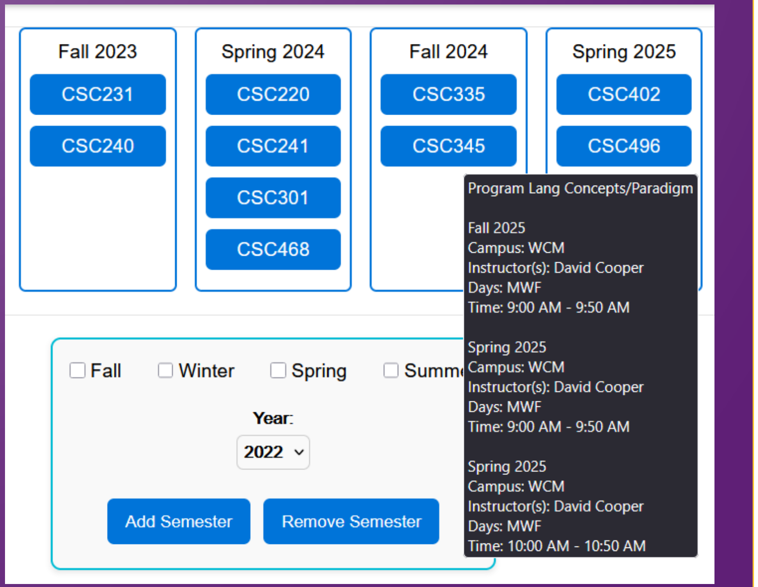
Spring 2025
Campus: WCM
Instructor(s): Ashik Bhuiyan
Days: MWF
Time: 11:00 AM - 11:50 AM



CSC416
No Spring 2025 or Fall 2025 offering available.



CSC242
No Spring 2025 or Fall 2025 offering available.



Program Lang Concepts/Paradigm

Fall 2025
Campus: WCM
Instructor(s): David Cooper
Days: MWF
Time: 9:00 AM - 9:50 AM

Spring 2025
Campus: WCM
Instructor(s): David Cooper
Days: MWF
Time: 9:00 AM - 9:50 AM

Spring 2025
Campus: WCM
Instructor(s): David Cooper
Days: MWF
Time: 10:00 AM - 10:50 AM

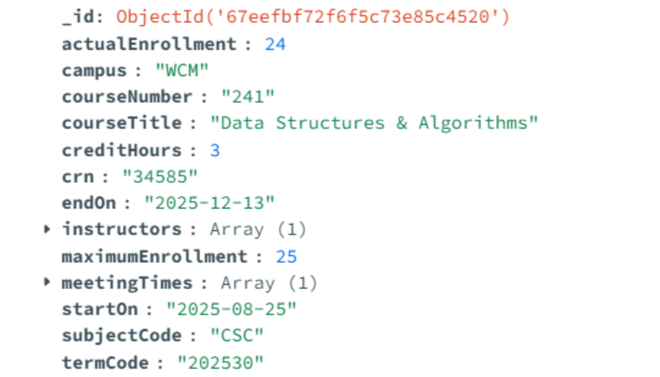
WCUPA PUBLIC COURSE CATALOG API

Partnership with WCUPA Academic Systems

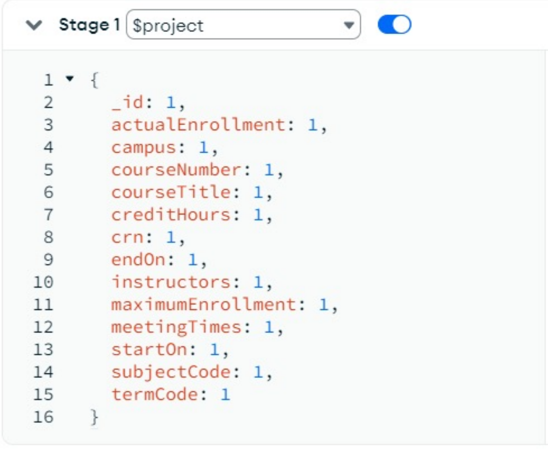
- Worked with Enterprise Systems Team:
  - Jenna Krier, Derick Cohenour, Edward Fingland, and their supervisors
- Gained secure API access to live public course data

Behind the Scenes

- Pulled and parsed Ellucian API course data
- Saved parsed data into MongoDB course_data collection
- Used aggregation techniques to format for planner use
- Secure, production-grade data — No manual entry needed
- Realistic schedule building — Students plan with actual offerings



```
  _id: ObjectId('67eefbf72f6f5c73e85c4520')
  actualEnrollment : 24
  campus : "WCM"
  courseNumber : "241"
  courseTitle : "Data Structures & Algorithms"
  creditHours : 3
  crn : "34585"
  endOn : "2025-12-13"
▸ instructors : Array (1)
  maximumEnrollment : 25
▸ meetingTimes : Array (1)
  startOn : "2025-08-25"
  subjectCode : "CSC"
  termCode : "202530"
```



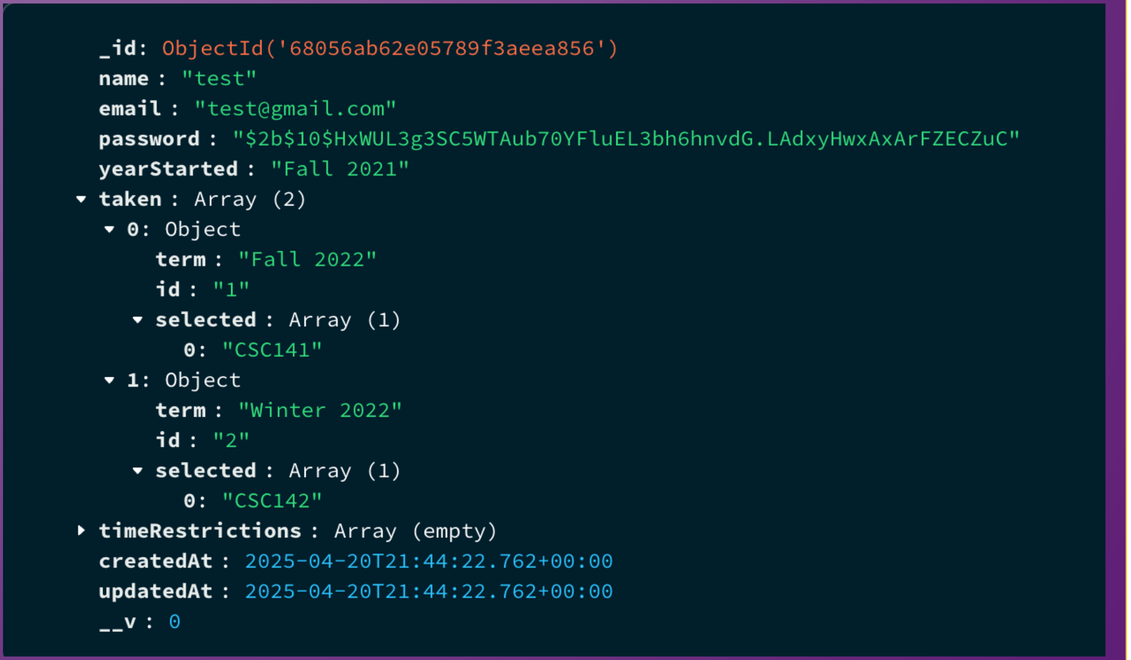
Stage 1 $project

```
{
    _id: 1,
    actualEnrollment: 1,
    campus: 1,
    courseNumber: 1,
    courseTitle: 1,
    creditHours: 1,
    crn: 1,
    endOn: 1,
    instructors: 1,
    maximumEnrollment: 1,
    meetingTimes: 1,
    startOn: 1,
    subjectCode: 1,
    termCode: 1
}
```

MONGODB & MONGOOSE

User data is saved when a student logs in and interacts with the planner

- Each saved semester stores:
  - ○ **Term name** (ex: *Fall 2022*)
  - ○ **Column ID** (order for visual layout)
  - ○ **Selected courses** (stored as an array)
- Benefits
  - ○ Personalized course planning — Saves progress across sessions
  - ○ Flexible data retrieval — Easily load saved schedules
  - ○ Secure user management — Data is linked to individual user accounts



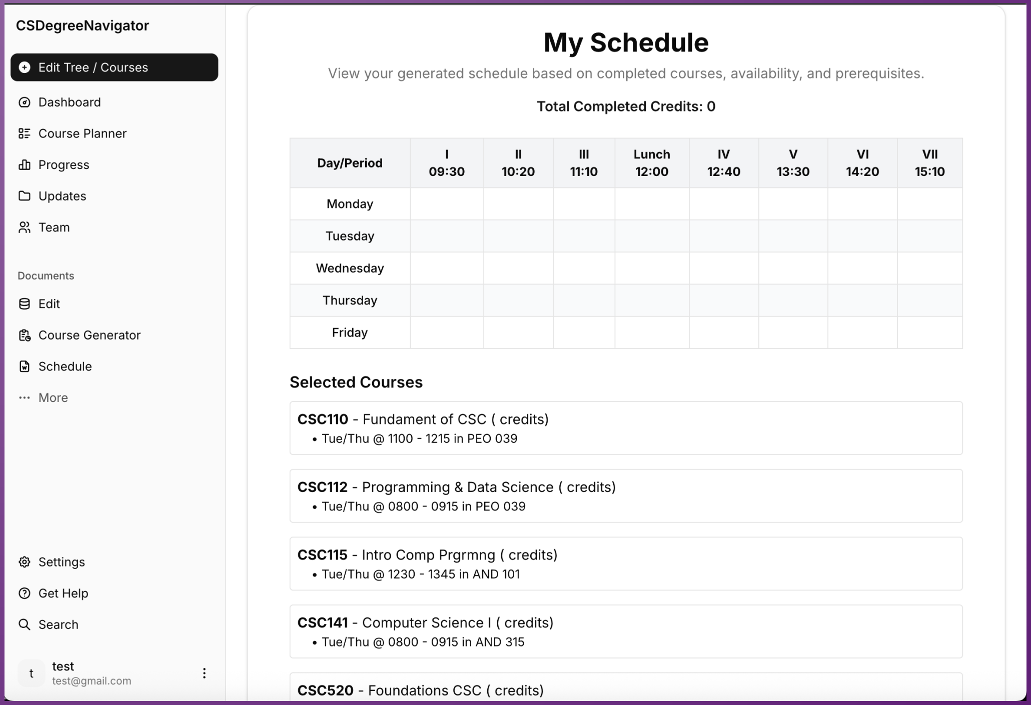
```
   _id: ObjectId('68056ab62e05789f3aeea856')
   name : "test"
   email : "test@gmail.com"
   password : "$2b$10$HxWUL3g3SC5WTAub70YFluEL3bh6hnvdG.LAdxyHwxAxArFZECZuC"
   yearStarted : "Fall 2021"
 ▾ taken : Array (2)
   ▾ 0: Object
       term : "Fall 2022"
       id : "1"
     ▾ selected : Array (1)
         0: "CSC141"
   ▾ 1: Object
       term : "Winter 2022"
       id : "2"
     ▾ selected : Array (1)
         0: "CSC142"
 ▸ timeRestrictions : Array (empty)
   createdAt : 2025-04-20T21:44:22.762+00:00
   updatedAt : 2025-04-20T21:44:22.762+00:00
   __v : 0
```

HOSTING & DOCKER

- **Original Plan** — Hosting through csdn.wcu.ninja — provided by Dr. Chen
- **Revised Approach** — Containerized deployment with Docker Compose for flexibility and scalability
  - ○ Application and MongoDB database run as separate services inside lightweight containers
  - ○ Custom web container built from project source using a Dockerfile
  - ○ MongoDB container auto-seeded with course_data from a /seed directory at startup
- **Benefits of the New Setup**
  - ○ Pre-populated database — no manual data entry needed
  - ○ Portable — project can be pulled from Docker Hub or built locally on any machine
  - ○ Persistent MongoDB storage — data survives container restarts using named Docker volumes
- **Current Deployment Status**
  - ○ csdegreenavigator-web container hosts the app on port 3000
  - ○ csdegreenavigator-mongo container hosts MongoDB on port 27018

FUTURE COURSE GENERATOR

- This will be attached with course plan.
- Able to generate/display based on time restrictions.
- Also allow for visualizing data and progress towards graduation in detail.
- Also, load data from course planner to make simplistic use.



My Schedule

View your generated schedule based on completed courses, availability, and prerequisites.

Total Completed Credits: 0

Day/Period	I 09:30	II 10:20	III 11:10	Lunch 12:00	IV 12:40	V 13:30	VI 14:20	VII 15:10
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								

Selected Courses

CSC110 - Fundament of CSC (credits)
- Tue/Thu @ 1100 - 1215 in PEO 039

CSC112 - Programming & Data Science (credits)
- Tue/Thu @ 0800 - 0915 in PEO 039

CSC115 - Intro Comp Prgrmng (credits)
- Tue/Thu @ 1230 - 1345 in AND 101

CSC141 - Computer Science I (credits)
- Tue/Thu @ 0800 - 0915 in AND 315

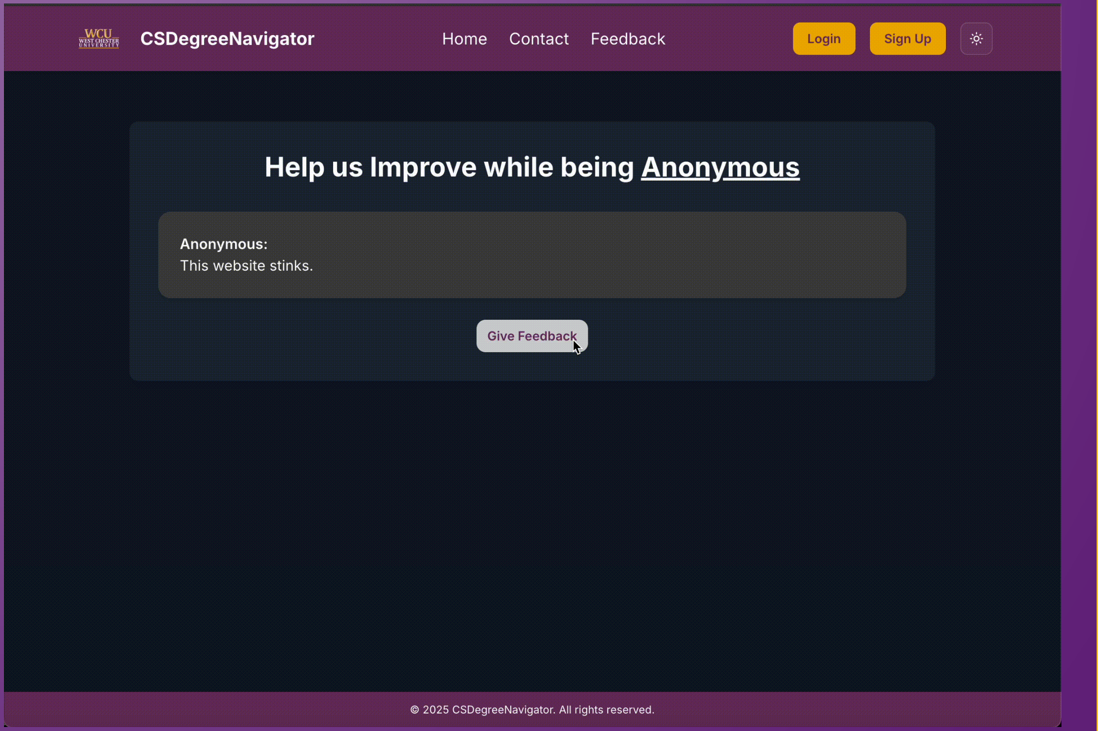
CSC520 - Foundations CSC (credits)

USER USABILITY STUDY

- Students naturally prefer the course planner design; Students felt that interactivity made it more flexible than platforms such as RamPortal.
- Importance of User Usability Study:
  - Gives us feedback that aids in our direction and improvement.
  - Issues and bugs that pass-through development are caught
    - A student mentioned our columns started in a later year then the initial year they entered.
- This feedback led us to remodel our approach on handling the "year started" concept, allowing the user to be able to select directly from the planner.

USER USABILITY IN THE FUTURE

- We saw that what the client and user wants both matter.
- We implemented a basic system that allows a user to enter data anonymously.
- Our goal with this is to get constructive criticism to improve potential requests, address any flaws, or general feedback.



Help us Improve while being Anonymous

Anonymous:
This website stinks.

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WEBSITE STRUCTURE

Model-View-Controller (MVC) pattern:

- Models: MongoDB Schemas (Users, Courses)
- Views: React.js Pages and Components
- Controllers: API Logic (saving, loading, managing prerequisites)

educative.io

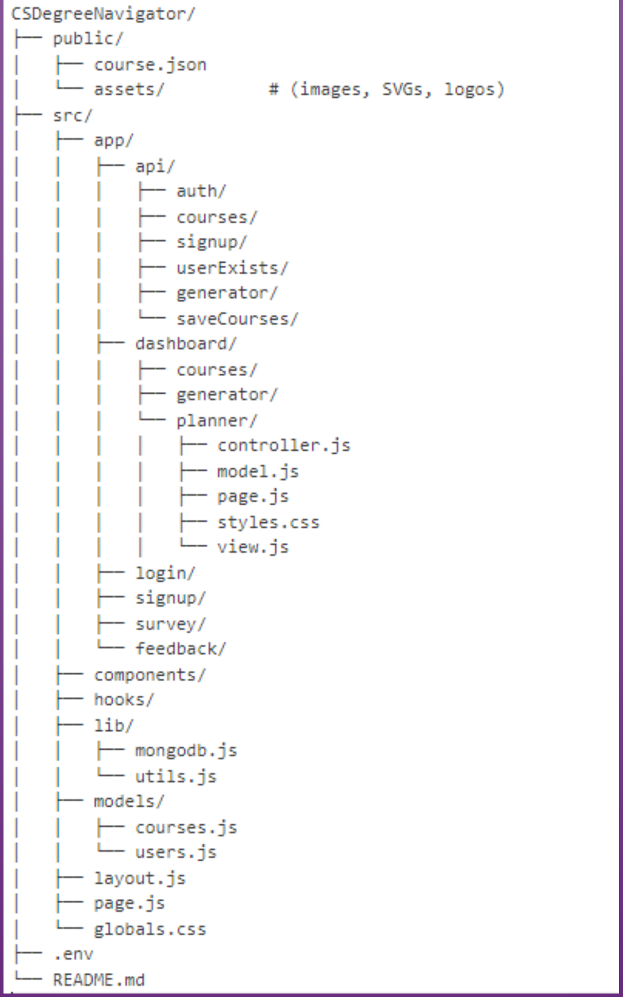
Benefits

- Scalable structure — Easier to maintain and update
- Separation of concerns — Cleaner code and faster debugging
- Industry standards — Built like real-world professional apps

Technology Stack

- MongoDB — Manages user data and course offerings
- Express.js — Server-side routing and APIs
- React.js — Builds dynamic course planner interfaces
- Node.js — Backend runtime environment

UPDATED CODE STRUCTURE



```
CSDegreeNavigator/
├── public/
│   ├── course.json
│   └── assets/          # (images, SVGs, logos)
├── src/
│   ├── app/
│   │   ├── api/
│   │   │   ├── auth/
│   │   │   ├── courses/
│   │   │   ├── signup/
│   │   │   ├── userExists/
│   │   │   ├── generator/
│   │   │   └── saveCourses/
│   │   ├── dashboard/
│   │   │   ├── courses/
│   │   │   ├── generator/
│   │   │   └── planner/
│   │   │   │   ├── controller.js
│   │   │   │   ├── model.js
│   │   │   │   ├── page.js
│   │   │   │   ├── styles.css
│   │   │   │   └── view.js
│   │   ├── login/
│   │   ├── signup/
│   │   ├── survey/
│   │   └── feedback/
│   ├── components/
│   ├── hooks/
│   ├── lib/
│   │   ├── mongodb.js
│   │   └── utils.js
│   ├── models/
│   │   ├── courses.js
│   │   └── users.js
│   ├── layout.js
│   ├── page.js
│   └── globals.css
├── .env
└── README.md
```

CLIENT IMPRESSION

Midpoint Feedback

- Dr. Ngo suggested redesigning the course display tree for better semester-by-semester visualization and clearer prerequisite connections.

Action Taken

- Quickly redesigned the course planner to match Dr. Ngo’s feedback.
- Improved layout and flow based on usability priorities.

Final Impression

- Dr. Ngo praised our responsiveness and professionalism.
- He was highly satisfied with the updated design and overall user experience.
- Expressed confidence in the future potential of the platform.

WHAT WE LEARNED

Team Dynamics

- Grew more comfortable sharing ideas and raising concerns.
- Improved collaboration and communication over time.

Client Communication

- Learned that clients may change requirements as they better visualize the product.
- Recognized the importance of advising the client when ideas are not feasible or optimal.

Problem Solving

- Frequent client meetings allowed early identification and resolution of issues.
- Breaking complex challenges into smaller, manageable tasks improved our workflow.

Time Management

- Early task breakdowns and consistent check-ins kept the project on track and ahead of schedule.

DID WE MEET OUR MILESTONES?

☑ **February 21:** Project Plan completed & initial requirements collected

☑ **March 10:** Complete initial data processor & GUI creation

☑ **March 24:** Infrastructure & deployment setup

☑ **March 31:** Database & GUI integration

☑ **March 31:** Visual representation of graduation progress complete

☑ **April 4:** Interactive course selection & conflict detector complete

☑ **April 14:** End-to-end testing and bug fixes

☑ **April 28:** Final project completed and hosted

□ **May 5:** Final project presentation and video demo

QUESTIONS?