

Lab 1: Monarch Course Explorer Description

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Table of Contents

1 Introduction.....	2
2 Monarch Course Explorer Product Description.....	3
2.1 Key Product Features and Capabilities	3
2.2 Major Components (Hardware/Software).....	4
3 Identification of Case Study.....	5
4 Monarch Course Explorer Product Prototype Description	6
4.1 Prototype Architecture (Hardware/Software)	8
4.2 Prototype Features and Capabilities.....	8
4.3 Prototype Development Challenges.....	9
5 Glossary	10
6 References.....	11

Listing of Figures

Figure 1: Current Process Flow	3
Figure 2: Proposed Solution Flow	4
Figure 3: Major Functional Component Diagram	5
Figure 4: Syllabi Features and Functionality	6
Figure 5: Syllabi Features and Functionality Continued	7
Figure 6: Feedback Features and Functionality	7
Figure 7: Other Features and Functionality	8

1 Introduction

A 2022 study from the University of Texas showed that 81 percent of college students in the United States are also employed. As it stands right now, students do not have access to some information that is essential to creating a class schedule that fits around their personal schedule. Often times, this information, such as syllabi, is not available to students until the class has already started. Old Dominion University currently does not have a tool that students and faculty can use to create more customizable learning experiences and discuss detailed information such as syllabi and feedback about the classes being offered.

As shown in Figure 1, students are wasting time and money by signing up for classes that they do not know much about and then having to drop out when they begin to conflict with their work or personal schedule. Some students do not live on campus and are unable to commute, so they rely solely on the course information that ODU offers online. There are issues that stem from this that negatively affect ODU faculty as well. There are only a few places where professors can receive feedback from students, and the students who provide the feedback are usually ones that either had a very pleasant or a very negative experience with the class. There are already websites that allow students to leave feedback about their professors, such as RateMyProfessors; however, there is no student verification process and nothing stopping professors from rating themselves. Advisors may be able to answer a lot of questions students may have regarding classes, but they can still have a difficult time setting up a personalized schedule for students if they do not have access to information that shows how professors teach their courses. Another group of ODU faculty troubled by this issue are the members of the curriculum committees, as they currently have to spend a lot of time making sure that syllabi meet the university's objectives and ABET standards of accreditation.

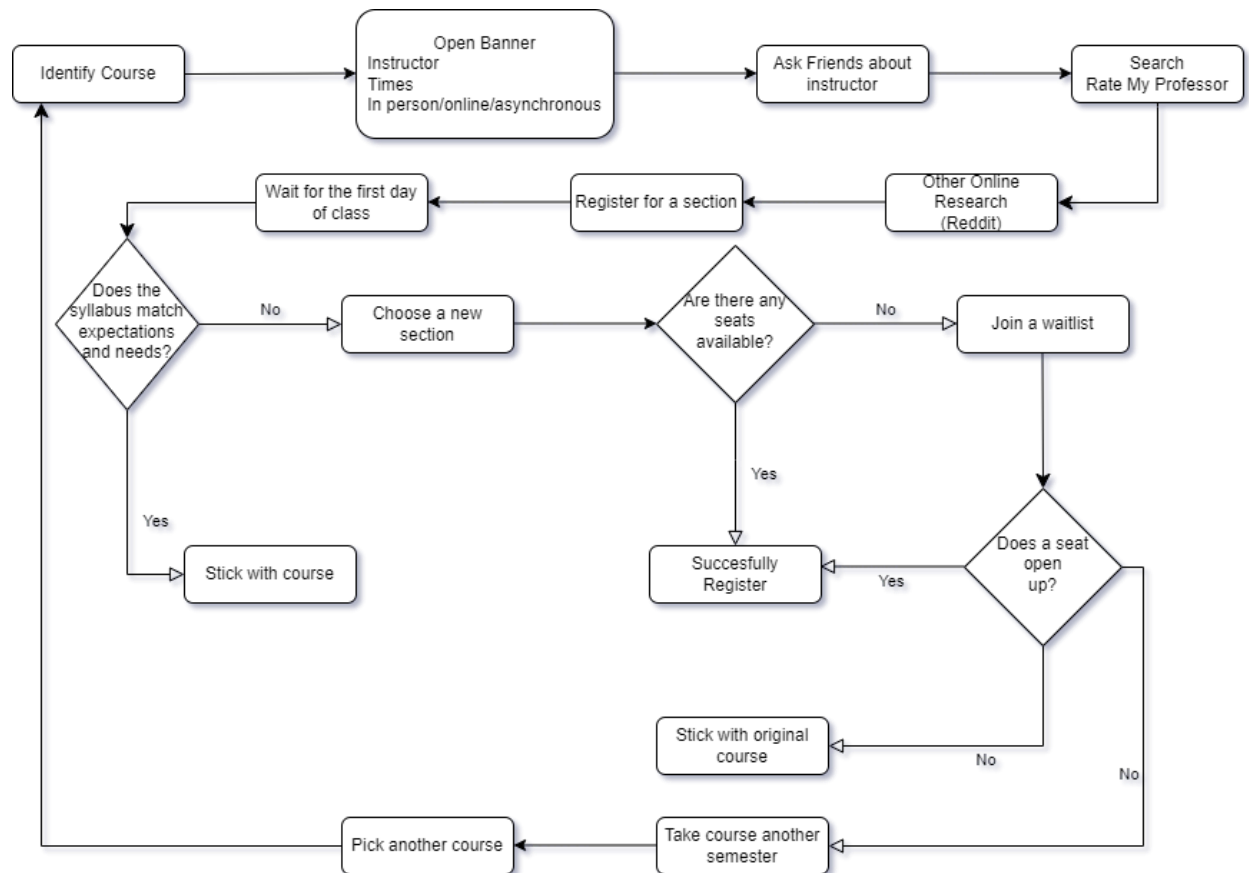


Figure 1: Current Process Flow

2 Monarch Course Explorer Product Description

Monarch Course Explorer is a moderated web application where students and faculty can view and share information pertaining to the classes that are offered at ODU, such as syllabi and course feedback. This will give the ODU community a better sense of how the courses have been handled each semester. This web application is intended to aid ODU students in finding the information they need to register for the classes that best fit their schedule and learning style, while also giving ODU faculty an easier way to share information with their students.

2.1 Key Product Features and Capabilities

Monarch Course Explorer will allow faculty to upload, view, and compare course syllabi and course feedback. Faculty can also respond to feedback, and any harmful or non-constructive

feedback will be removed. All users will be able to filter uploaded syllabi by professor, semester, and other common features of syllabi, such as attendance policy and required textbooks.

Monarch Course Explorer will also provide an optional short survey about the features they are looking for in a course, and the survey will generate suggestions based on the responses the user gives. Figure 2 shows how students can use Monarch Course Explorer to select courses to take.

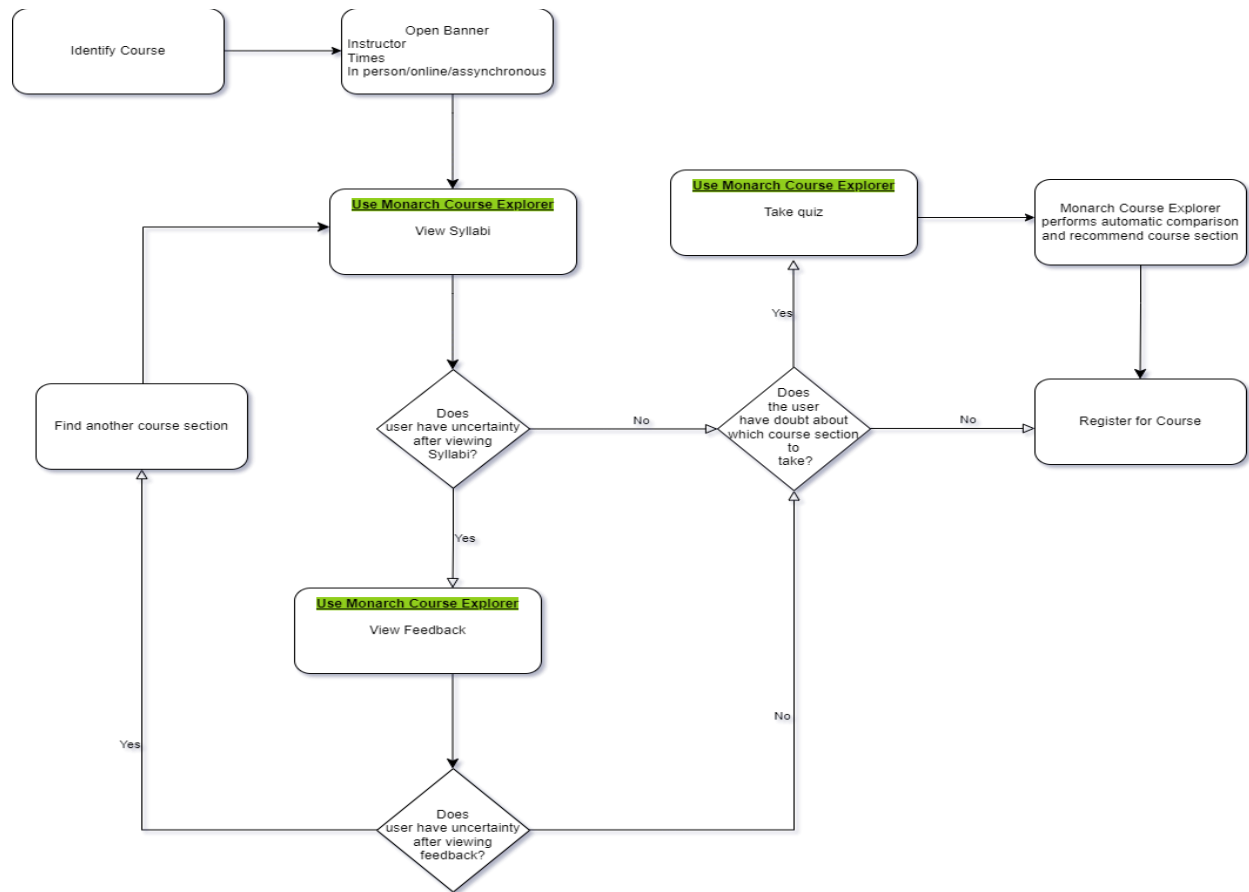


Figure 2: Proposed Solution Flow

2.2 Major Components (Hardware/Software)

As for the front-end of Monarch Course Explorer, any user will have the ability to view and compare syllabi. But actions that involve modifying the website in any way, such as uploading syllabi, providing course feedback, and reporting negative feedback, will require users to authenticate themselves using their MIDAS credentials, as can be seen in Figure 3. On the back

end, Monarch Course Explorer will authenticate users as well as scrape syllabi so they can be normalized, analyzed, and stored in a database.

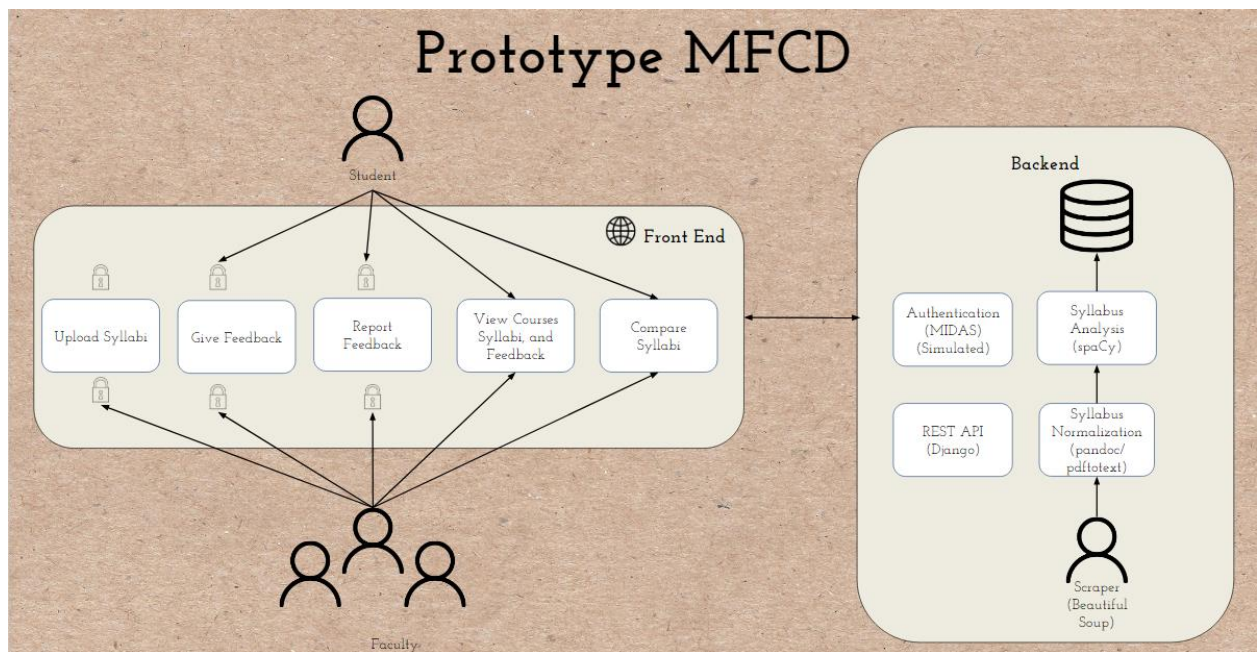


Figure 3: Major Functional Component Diagram

The front-end of the Monarch Course Explorer web application will be built using HTML to display all necessary elements to the users, CSS for the website's formatting and design, and JavaScript to handle all interaction between the website and the users. On the backend, Python libraries such as BeautifulSoup will be used to scrape important information from syllabi, and spaCy will be used to perform NLP transformations. Uploaded syllabi and feedback will be stored in a database using PostgreSQL. The web application's API will be created using the Django REST framework in order to make the application as easy to use as possible.

3 Identification of Case Study

Monarch Course Explorer is built for and designed to be used by ODU students and faculty. It will serve as an extension of ODU's primary course catalog, so students can use it to make well-informed decisions on what classes to register for, professors can use it to provide any

additional information about their courses they want students to see, and advisors can use it to create more personalized educational experiences for the students they are advising. Members of the curriculum committee can use Monarch Course Explorer to easily view and compare syllabi in order to see if any changes need to be made to them. While Monarch Course Explorer is currently only intended to work for ODU students and faculty, it could potentially be implemented for other universities in the future.

4 Monarch Course Explorer Product Prototype Description

The Monarch Course Explorer prototype will be used by ODU students and faculty to spread and view information pertaining to ODU courses. The prototype's capabilities are slightly reduced as it will have most of the real-world product's features implemented, but a couple features will only be partially implemented, as seen in Figures 4, 5, 6, and 7. Although the prototype will not have every feature implemented, it will still include every feature that will allow users to learn more and talk about ODU courses.

Features	Student	Faculty: Professor	Faculty: Advisor	Faculty: Curriculum Committee Member	Real World Product	Prototype
Upload Syllabi		✓		✓	✓	✓
Scrape Syllabi		✓		✓	✓	✓
View Syllabi	✓	✓	✓	✓	✓	✓
Side-By-Side View	✓	✓	✓	✓	✓	✓
Analyze Syllabi in Different Formats					✓	Partial

Figure 4: Syllabi Features and Functionality

Features	Student	Faculty: Professor	Faculty: Advisors	Faculty: Curriculum Committee Member	Real World Product	Prototype
Verify Inclusion of Required Sections				✓	✓	✓
View Report of Missing Sections				✓	✓	✓
Filter by Sections	✓		✓	✓	✓	✓
Compare sections	✓		✓	✓	✓	✓

Figure 5: Syllabi Features and Functionality Continued

Features	Student	Faculty: Professor	Faculty: Advisor	Faculty: Curriculum Committee Member	Real World Product	Prototype
View Feedback	✓	✓	✓		✓	✓
Rate Feedback	✓	✓			✓	✓
Provide Feedback	✓	✓			✓	✓
Filter Feedback by Semester	✓	✓	✓		✓	✓

Figure 6: Feedback Features and Functionality

Features	Student	Faculty: Professor	Faculty: Advisor	Faculty: Curriculum Committee Member	Real World Product	Prototype
Authentication	✓	✓	✓	✓	✓	Simulated
Take Quiz	✓				✓	✓
View Course Recommendation	✓				✓	✓

Figure 7: Other Features and Functionality

4.1 Prototype Architecture (Hardware/Software)

The prototype will have all of the same hardware components as the real-world product and mostly the same software, with the exception of a few missing algorithms. The only hardware that users will need to use the prototype will be a computer with access to the internet. All of the software for the prototype will be designed using Visual Studio Code, and its progress will be tracked on GitHub. HTML, CSS, and JavaScript will be used to construct the web application itself. Python libraries such as BeautifulSoup, spaCy, and Django will be used to handle the syllabi and feedback algorithms. And PostgreSQL will be used to store syllabi and feedback in a database.

4.2 Prototype Features and Capabilities

The prototype addresses the problem mentioned before by giving ODU students and faculty a platform where they can see the uploaded syllabi and feedback that will allow them to create the best learning experience for themselves or others. The prototype will provide users with all the functionality they need to upload, compare, and filter syllabi, as well as view, rate, and provide feedback. Students will no longer have to register for classes that do not work for

them and be forced to drop them and quickly look for another one before the withdrawal deadline has passed.

4.3 Prototype Development Challenges

Since many of Monarch Course Explorer's features depend on its ability to read information from syllabi, one of the biggest challenges when developing it will be ensuring that all information that is extracted from syllabi and feedback is accurate and that nothing important is left out. Once the prototype is up and running, it might face some challenges gathering data since there may not be many professors who feel the need to upload syllabi or students who want to share their experiences with a particular course.

5 Glossary

BeautifulSoup: Python library that is used to parse HTML pages.

CSS (Cascading Style Sheets): A language used to control how HTML elements are displayed in a web browser.

Django: Python web framework that helps developers create secure and maintainable web applications.

HTML (Hypertext Markup Language): A standard markup language used to display documents in a web browser.

NLP (Natural Language Processing): A subfield of computer science, artificial intelligence, and linguistics that revolves around computers interpreting, understanding, and manipulating human language.

SpaCy: Python library used for advanced natural language processing.

6 References

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