Comp 3008 Project 1 - Degree Planner

Group 27: Just trying to pass

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Part 1:

Requirement Analysis

Degree: Biochemistry

Biochemistry All (20.0 Credits). This has 4 specializations, Biochemistry B.Sc. Honours, Biochemistry and Biotechnology B.Sc. Honours, Computational Biochemistry B.Sc. Honours, and Biochemistry B.Sc. Major.

Persona #1

Name: Harry

Background

- 18, Male
- First Year in Carleton University Biochemistry B.Sc. Honours Program
- Hard Working
- Excellent with Technology and different software for design

Motivations

- Staying well connected with family
- Loves Streetwear and athletic fashion
- Interested in producing beats and instrumentals

Frustrations

- Long commute to Carleton everyday
- Not able to get the latest clothing drops from streetwear brands

Description: Excelled through high school achieving graduating with honours. In his free time, loves to build his wardrobe and browse fashion brands and look books to find new inspirations. Goes to the gym and swims to keep in shape and make up for his diet. Decided to pursue Biochemistry to become a researcher later in life and study different chemicals and structures regarding the human body.

Persona #2

Name: Ron

Background

- 17, Male
- Just Accepted into Carleton University Biochemistry B.Sc. Majors
- Curious and Eager to Learn

· Struggles navigating through internet and phone applications

Motivations

· Loves Swimming, certified lifeguard
· Always keeps update on the latest video games for any console
· Created a start up tutoring company

Frustrations

· Long hours as a lifeguard
· Internet issues

Description: Is about to finish his last term in 12th grade and has decided to go to Carleton University. Number one priority is to keep grades up to keep offer. During downtime from school and work, tries out new games. He owns a PC, PlayStation, and a Nintendo Switch. Not sure what he wants to do after high school, so he decided to pick his two best subjects in high school and continue them in a post secondary education.

Persona #3

Name: Hermione

· 20, Female
· In third year currently pursuing a degree Carleton University Biochemistry B.Sc. Majors
· Well Networked, Curious

Motivations

· Owns a pet cat, always looking for ways to keep it healthy
· Into cooking and crafts, into concepts and layout designs
· Fitness instructor and coach's intramural volleyball

Frustrations

· Busy Gyms
· Cat ruining furniture

Description: Is now in their third year of this program and still has not decided what to do after. Dedicates most time to school. Free time goes to spending time with her cat and watching Netflix. She loves to be healthy and always finds new workouts to add in and teach to new people at the gym. Her favourite sport being volleyball keeps her driven to teaching people perform like a team.

Scenarios:

Scenario #1:

You've changed your degree specialization thus your degree requirements changed. You are planning out the courses for your next semester. Now that some of your prerequisite courses that you have taken don't count towards the updated schedule; you have to go back and take lower year courses. You start setting up your courses and checking which courses are offered in the coming semesters. You notice you can get a day off if you push one course off to the next semester. With the rigid course planning Biochemistry has, any slip could cause you to take an extra year. You go through Carleton University's undergraduate calendar website to check each course you need for your degree and start mapping the dependant courses. You're worried all the work you have put on yourself increases the chance of you making a mistake or overlooking something.

Do you think a system could help you find an optimum schedule? How?

Scenario #2:

You are planning your course selection and have two different websites to plan them on. The first is designed so one primary pane is shown; you interact with the pane by scrolling and clicking course boxes, which are already laid out for you. In this design you fill in the spaces where the requirements allow you to make a choice which flows the rest of the map. The second splits the screen. In the first side you see information about courses and the other side is the planning and effects for semesters to come.
Describe how you imagine the systems would compare.
Would you expect these designs to help you? How?

Scenario #3:

You took summer school courses so now your degree has been accelerated. Now you're looking to continue with some upper year courses to get ahead. The only problem with that is, the courses you're looking at only run certain semesters. To provide more efficient semesters you look at the next summer as well to plan out an even semester where all the courses you can take are accounted for.
What would you want to help you get a head without having to wait for the regular schedule?
Do you feel like the systems presented could keep you from running into issues with the semester specific problems?

Interview Script:

First Part: Greet the interviewee, ask how their day was, if they had any classes today, ask if excited for reading week, and if they have any plans

Inform who we are (Students in COMP 3008 working on a project for this course that involves us to interview people in the degree we chose to build a system for)
Ask

1. What goes through your mind when selecting courses for a new semester?
2. How do you approach the wide selection you have for certain degree requirements? What would make it better?
3. Where do you find information on your course planning and how useable do you find that method?
4. Who are you most likely to contact for course help, your colleagues or course advisor? Are either of them
5. Would having a tracker that shows future courses and requirements to build your course calendar motivate you enough to plan?
6. Is there anything you dislike about Carleton Central which you feel could be a common problem in other systems?
7. Is there anything you like about Carleton Central that you would like to see elsewhere?

8. Show prototype 1 ask for feedback on every detail step by step
9. Show prototype 2 ask for feedback on every detail step by step
10. Run by the three Scenarios and ask for them to think out loud about how the prototype will handle as they go through each of them - scenario 1
11. Scenario 2
12. Scenario 3

Interview 1: Nicole

1. Am I getting the correct prerequisites for the courses I wish to take later, how many of these courses have a lab component, will it fit in my calendar, do I have the prerequisites necessary
2. It's a little overwhelming, i find myself doing a days worth of research before selecting and often changing anyway because i've missed or overlooked something. The number of options is nice but there is no efficient way to see these options or the prerequisites.
3. Undergraduate calendar… it's a mess. The myAudit,and other functions on carleton central don't provide enough information to work with.
4. Unless i sit down with an academic advisor there's no easy way to see if I'm on the right track. Whenever there's a question of meeting requirements to take a course the administration gives you the runaround sending you to the department heads and right back to administration
5. If i had a utility with an easy UI, that showed requirements for my graduating year i would honestly give my left arm for it. I'd plan out everything an save myself soooooooo many days of misery.
6. My degree is complicated by a lot of prerequisites and a lot of options. It's really easy to make a system that overlooks the complexity of it. It's also probably really easy to make a system that won't help. Carleton centrals systems don't help. They show courses on their own without showing what each course opens you up to take. What I'm saying is that showing pathways could help, give me a tree to look at and follow so I'm not blindly picking courses based off the title and meeting the prerequisites
7. I find carleton central too frustrating to use most of the time so no. Like with building my calendar for the semester, I use the engineering utility to build then only go onto carleton central once I know what to take.
8. Prototype 1 - Degree Roadmap
    a. Complex
    b. Lines don't show requirements effectively when they mix
    c. Arrows would make progression more clear
    d. Not pretty
    e. Line from CHEM 3201 to CHEM 3202/3205
    f. Biol Choose 2 is hard to understand UI isn't pretty perhaps try showing a couple then a "..." to show the continuation. Missing a connecting line too
    g. BIOL3205/3206/3307 perhaps indicate that in needs to be interacted with
    h. show CGPA and percentages not letter grade like course selection
    i. what is degree spec?
9. Prototype 2 - Degree Calendar

    a. when's it offered? the text on the bottom doesn't indicate it effectively. Perhaps highlight the columns while dragging to show if it's available
    b. Shows nothing about what you need. Where is my comparison, how do I keep track of requirements
    c. Will it let me do things that I'm not allowed
    d. No real indication of when to do things "just like carleton central"
    e. No tree takes away from knowing what to pick up and place
    f. Would be frustrating to know what to take when you're selecting courses
10. Scenario 1 - more realistic that you fail a course than administration
    a. 1st system
        i. should handle this
        ii. giving a full grasp of how it's broken my tree

    b. The second system
        i. would blow up with red,
        ii. it would be overwhelming
        iii. very difficult to handle but would show what broke

Interview 2: Shari

1. Can I fit all the courses I want into my timetable, which courses will be the most applicable to the industry
2. Pen and paper usually, I write out all my course options and show what courses become available after taking them
3. undergraduate calendar, academic advisors, myAudit, there's a learning curve but its workable
4. The biochem society is really small so I talk to classmates and academic advisors mostly, profs can help too
5. This is my degree, that is enough motivation usually… For first and second year there's not much to plan, but i could see it being useful for less organized students or third and fourth year
6. The course selection page makes it hard to visualize your semester, I go back to pen and paper for this. Actual registration has too many unnecessary steps to it.
7. Not really.
8. Prototype 1 - Degree Roadmap
    a. Unclear, cluttered
    b. Too many lines to easily follow
    c. Doesn't show degree requirements easily - box is really small
    d. Hard to visualize where one is in the degree
    e. No way to separate semesters - forces you to plan by year
    f. Utility should highlight the courses you meet the prerequisites for
9. Prototype 2 - Degree Calendar
    a. Busy, difficult to understand
    b. No way to see degree requirements
    c. Utility should highlight the courses you meet the prerequisites for

Interview 3: Ron

1.) The first thing to consider when selecting courses is to determine how many and which courses are mandatory for my program. If there is additional room for courses, the things I consider are interest, but also if I am likely to achieve my desired grade in that course.
2.) I think having a wide selection for degree requirements is beneficial. It allows students to fine-tune their interests within set requirements. Also, it could also provide an opportunity for students who may have wanted to choose additional courses that were not part of the requirements but may have conflicted with certain mandatory courses
3.) To find information for course planning, I use the school's own academic calendar. Although it does include the main information most of the time, the system seems difficult to maneuver through. While it does give the baseline information of the course, like a summary of its content, prerequisites, and duration per week, it neglects some other practical information like the scheduling, or exams and assignments, or the course opinion in previous years.
4.) While a tracker would be more efficient and beneficial to students, I personally don't think it would cause me to plan more in advance than I already do. However, a tracker would facilitate and streamline the process; rather than motivating me to plan more ahead of time, it would reduce the time needed and confusion of course selection immensely.

The remaining questions were waived due to Ron not being a Carleton Student yet, and not having experience with Carleton Central, and the scenarios were not met due to time Constraints.

Initial Design Alternatives

Design 1: Degree Roadmap

This design was created with the principal idea that, the user needs to be able to easily identify the path to their degree completion, Thus was the main objective of this specific design. Participants often stated that they had to have multiple tabs open, one regarding the requirements for their program as well as the website for course registration. During this process they needed to consistently cross reference future requirements. This tedious process lead to confusion as it was disorienting to constantly monitor two sets of data. The solution we devised was to show the user a map of what they must complete to achieve their degree.

The largest part of this prototype is the degree roadmap. It was designed to be the largest section of the user's screen so it would draw the user's attention. The biochemistry program has many courses which each have their own set of requirements, to minimize confusion each course that requires a prerequisite is connected to it's required courses. The map is designed with fourth year courses at the top as objects at the top are the most

important.This is because the user may interpret that they require a good foundation of the required courses before they can attempt the courses found at the top of the planner.

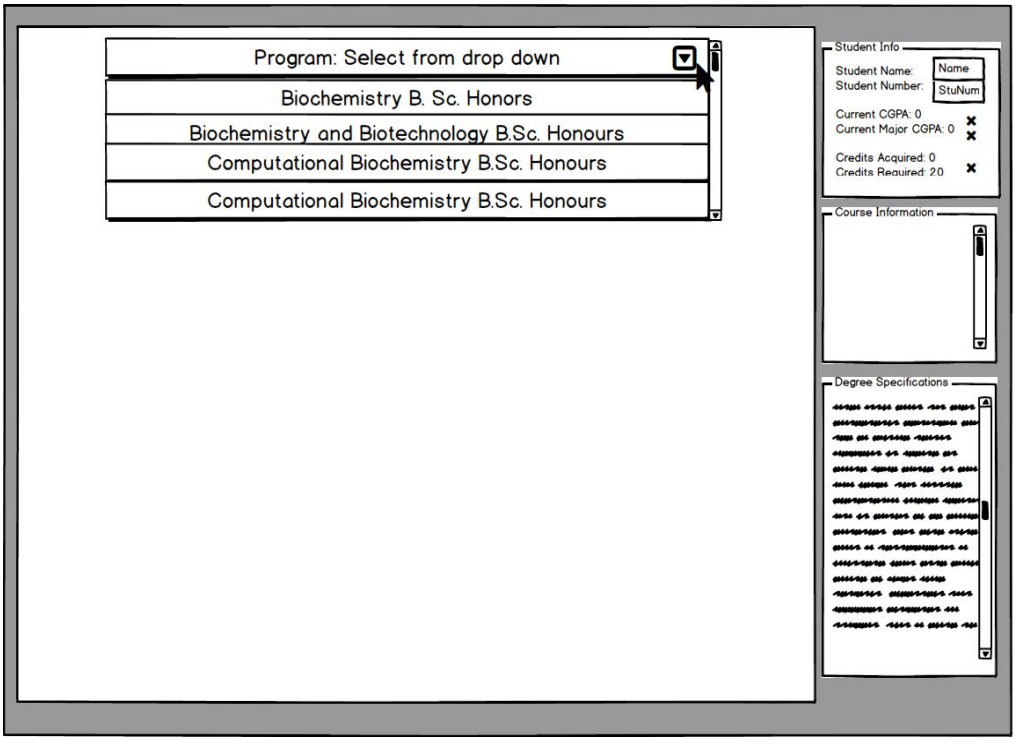
On top of the course roadmap there is a drop down which would indicate to the user that they must select the degree they are pursuing. The required courses are then separated into the years they should be taken in (1-4) as well as grouped together with related courses. The courses are rectangular buttons which subtly instruct the user to click on them to see what options are available(Instructing Interaction Type). When the course buttons are clicked the course information appears in an information box on the right side of the course roadmap.

On the right side of the course roadmap there are multiple blocks of information. The course information block has information regarding the course. The description of the course and its prerequisites are clearly stated. The user may also input their final grade and toggle the checkbox for whether the course is complete. The roadmap will then add a ✓ beside the completed course signifying that the requirement has been met. The Student Info box appears on the right side as well. It has all the student's information such as student name, student number, CGPA, etc. The application subtly instructs them to input information as the input boxes invite them to input information. The student info block has either an X or a ✓ which clearly signifies whether they meet the requirements of their program. The bottom right side of the application has the course requirements in text if the user would like to read the requirements. It is less important because the rest of the application shows what the course requirements are and this is simply here for the user to read.

Degree Roadmap low-fidelity prototype

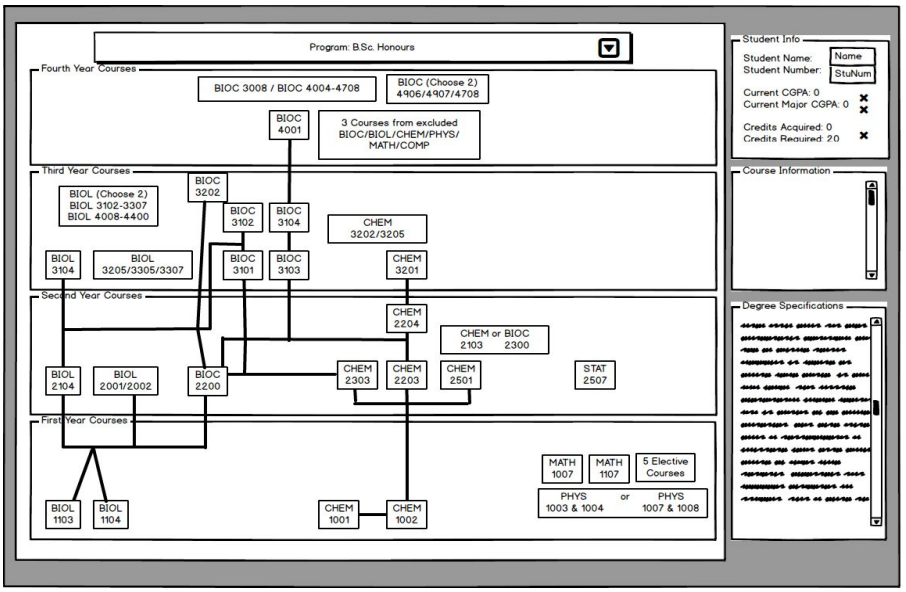
Main Visual Elements

STEP 1 - PROGRAM SELECTION



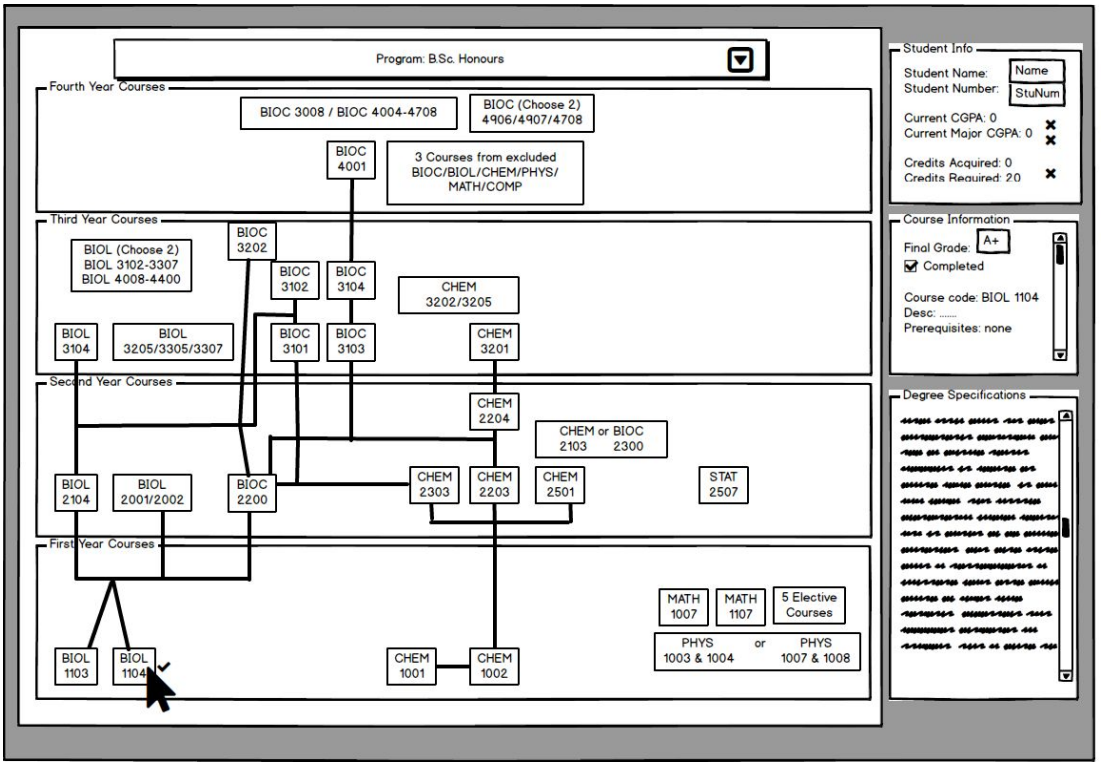
By prompting the user to select their program the drop down tab invites the user to click it, revealing the program which they are currently enrolled in.

STEP 2 - COURSE VIEWER



Once the program has been selected all the required courses and their related courses are populated into the course planning map. Split off into blocks recommending which years to take the coures in.

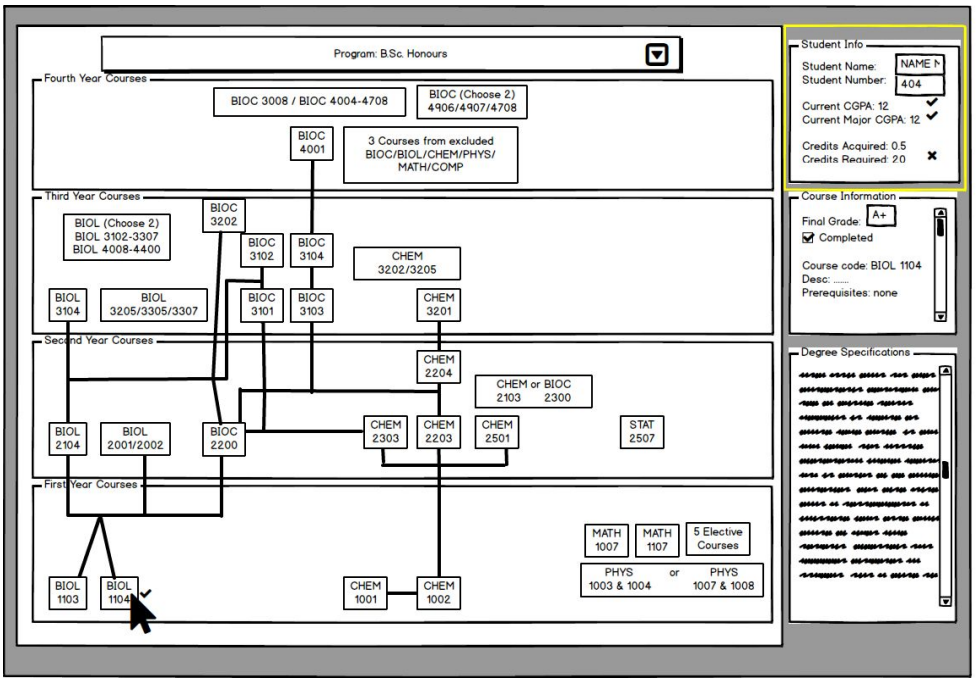
STEP 3 - COURSE CONFIRMATION / COMPLETION



By clicking the courses you can see the inofrmation on the course information tab, the user can then input what they received as a final grade in the course, and if they completed it or not.

Once it has been completed the information is then added to the student profile tab, a checkmark appears beside the course showing that it has been completed

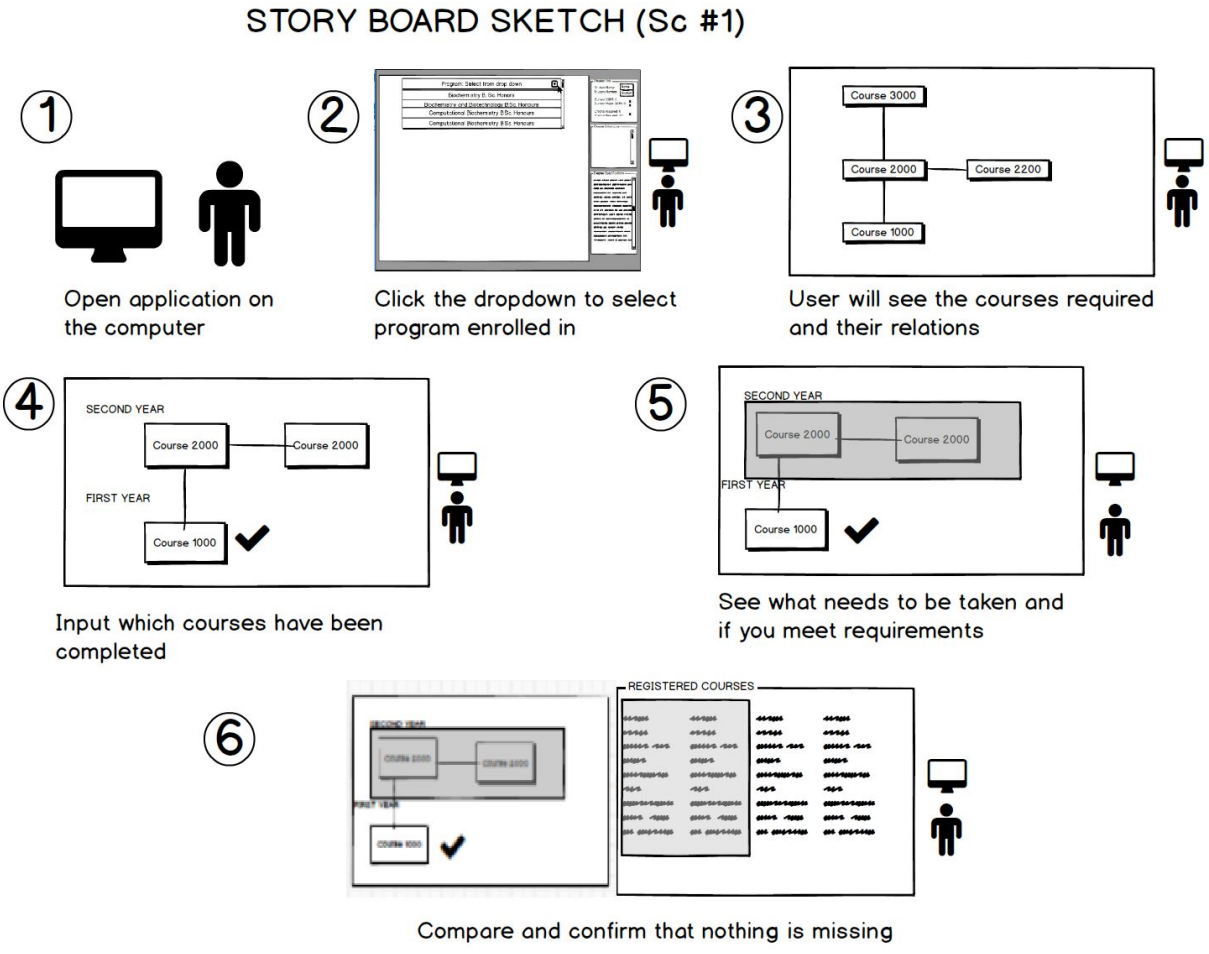
STEP 4 - STUDENT STATS



Student Info is updated once the course information is filled out,
calculates CGPA, Major CGPA and counts amount of credits aquired.

A checkmark or an x appears depending if the student is meeting the degree requirements

Storyboard Sketch Design 1: Degree Roadmap



Design 2 : Degree Calendar

This design was created with the main idea of showing what the user still needs to do in order to complete their program as well as displaying what and when something was done, thus leading to the name Degree Calendar. This system was designed to be more informative and inform when a course was available for a student as in scenario 3 where a student needs to take a course but they don't know when the course is available. Some participants stated that it was hard to figure out when the course was offered because when searching for the course code it would simply state it wasn't available this semester and not show any additional information as to when the course was offered. To remedy this problem we decided to create the degree calendar which displays the courses you require for degree completion as well as the course's information.

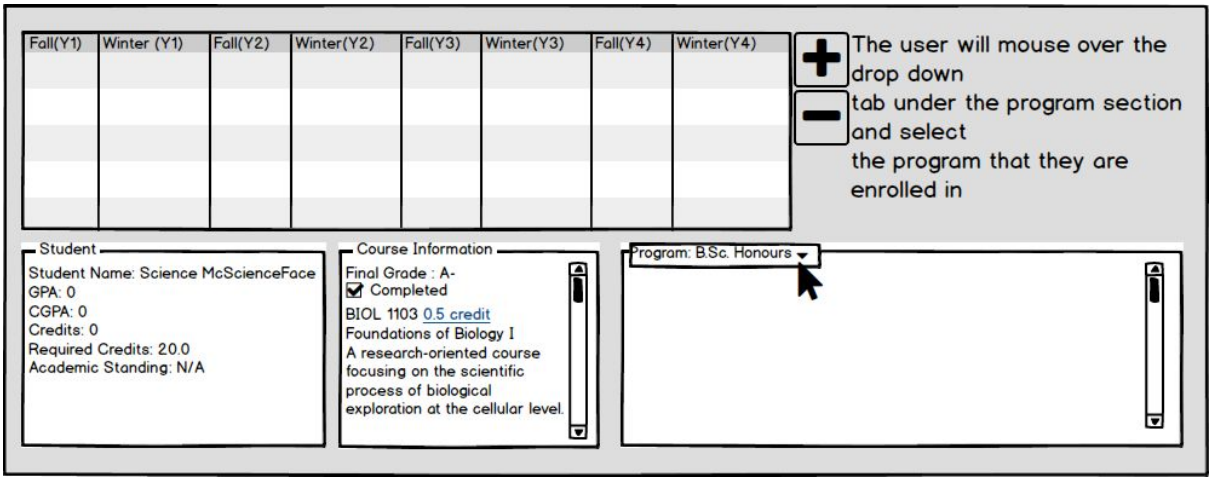
The main component of the degree calendar is the calendar. This shows the when the courses have been taken, and the user can plan ahead and place the courses they wish to take in the future semesters. The courses in the calendar that cannot be taken due to lack of prerequisites will appear red, which is a very clear visual indicator that something is wrong. The user may interact with the courses located in the calendar by clicking on them, these selected cells in the table are highlighted with a yellow colour. Once clicked the course information will appear on the bottom side of the system where the user may input the mark they received and the status of completion for the course.

Another important component of the degree calendar is the program requirements located at the bottom right of the system. This includes all the courses required for the completion of the program, the user can drag and drop them into the calendar component of the system if they wish to take that course during the desired semester. If the user wants to learn more about the course they must simply select it and it appears in the course information section. When courses are completed in the calendar portion of the system the completed courses are strikethroughed in the program requirements because they are a requirement that has been completed, this will reduce the visual strain on the user when they are trying to find which courses they still need to take.

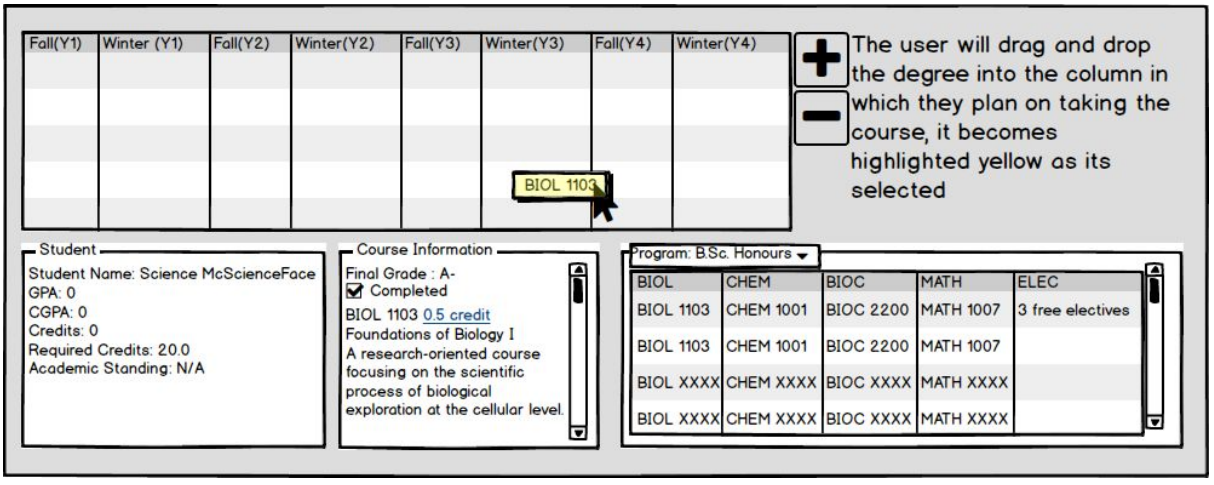
Another component of the degree calendar is the student info located on the bottom left of the system. This is very standard block of information regarding the user, it will calculate their CGPA, Major CGPA, credits earned, etc. It will also add a checkmark or an x if the stat does not meet the requirement for program completion. This will convey what the student is lacking and will allow them to make the proper decisions so they will graduate on the schedule they decided on.

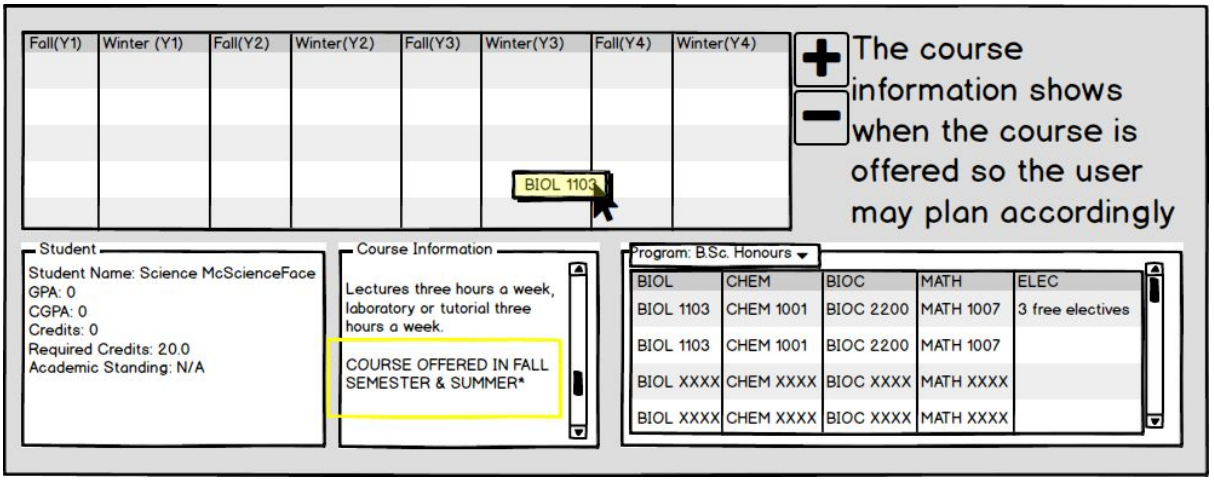
Degree Calendar low-fidelity prototype
Main Visual Elements

STEP 1 - PROGRAM SELECTION

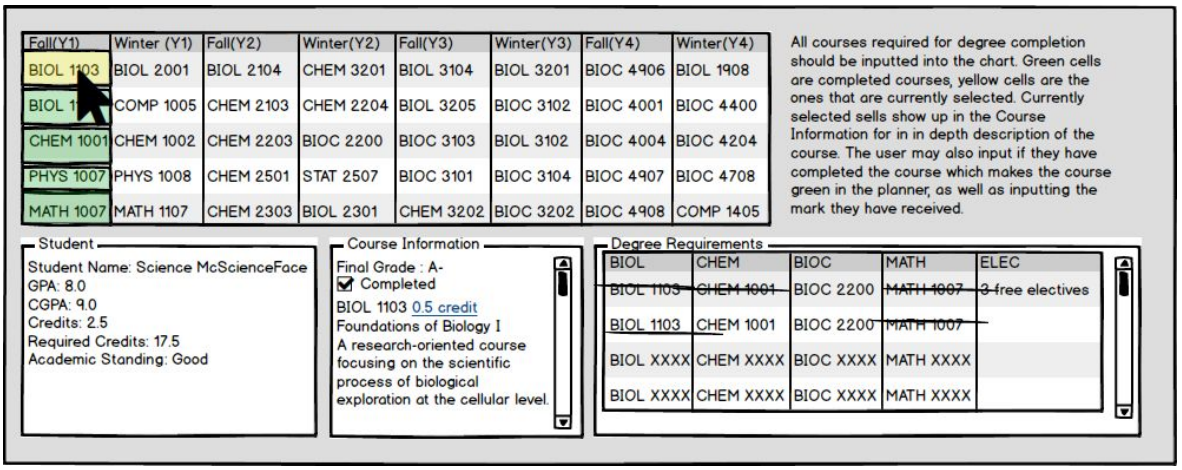


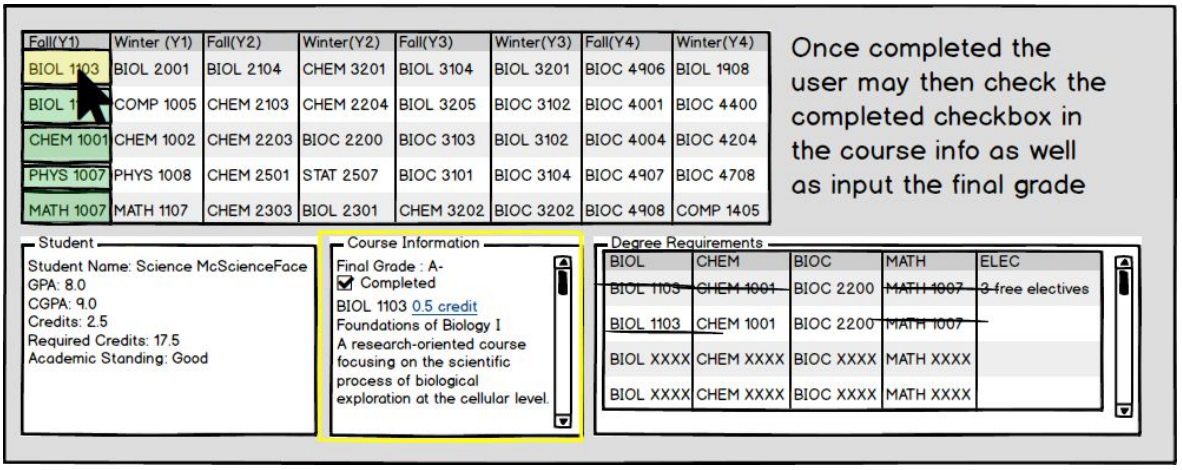
STEP 2 - COURSE SELECTION

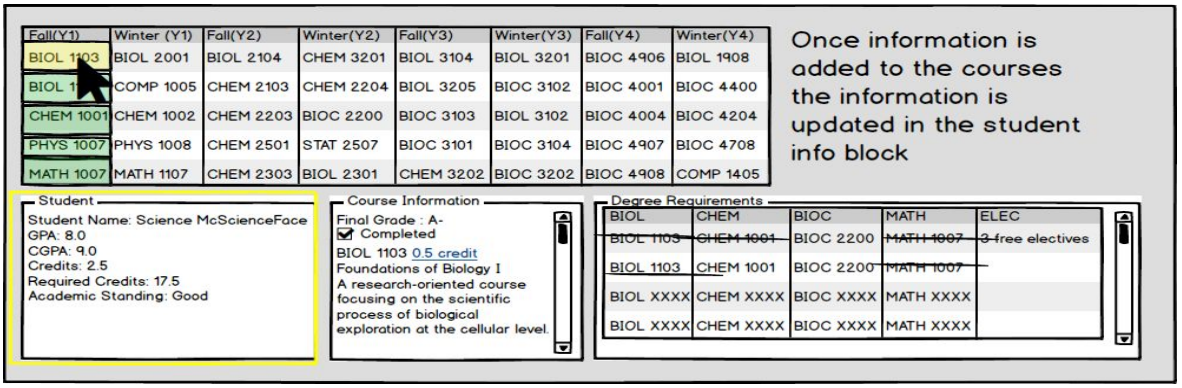


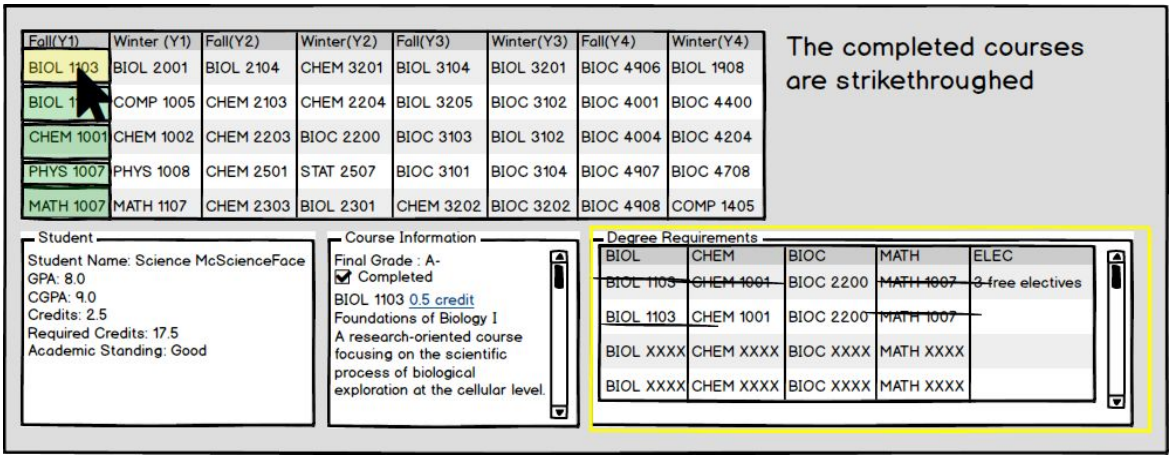


STEP 3 - COURSE CONFIRMATION/COMPLETION

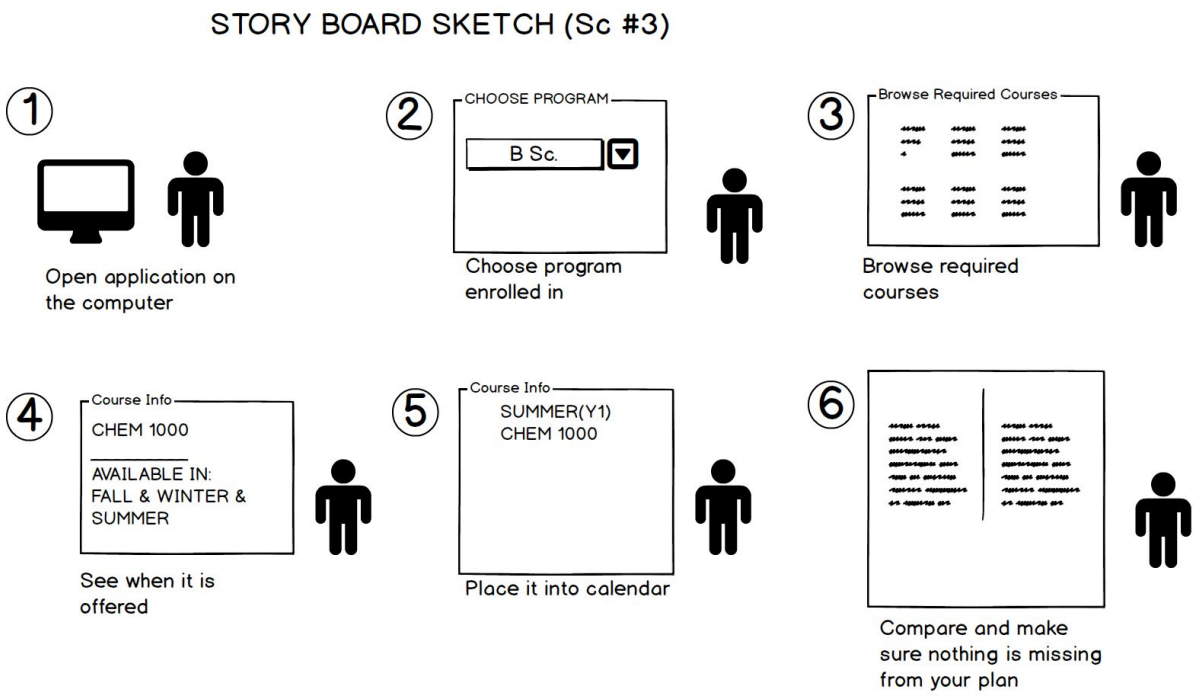








Storyboard Sketch Design 2: Degree Calendar



Prototype Evaluation and Iteration

Cognitive Walkthrough: **Degree Roadmap**

The user of the system would be a university student which is registering for their second set of courses during the second year of their program, they did not initially use this program for first year but it was recommended to them through a peer. The tasks that will be analyzed during this walkthrough are the following: Marking a course as completed and seeing which course should be taken next.

Walkthrough Procedure Walking

Step	Correct Action?	Notice the Action?	Feedback?
1. The student will begin by opening the application, they will have selected their desired program and the information such as courses would be displayed in the course roadmap.	[YES] The user would know what action to take because the only thing available to the student would be the program tab with a drop down which allows them to select the program they are pursuing.	[YES] The user will understand how to select the course they desire from the drop down list at the top of the page.	[YES] The user will see all the courses load into the yearly blocks as well as having the program name at the top of the application.
2. The student will then click on the course in the roadmap to view its course information and its state of completion	[NO] The user will see a bunch of listed courses after the they have selected their program, they will not know that they must click on the courses to view additional information and fill out the course's status.	[YES] Although the initial access to the course information is not well defined the process of marking a course as completed as well as inputting the final grade obtained is easy to understand. The information pops up on the right after selection with a text field for mark and a checkbox for completion.	[YES] Once the user has filled out the information for their completed course a ✓ is added beside the course in the road map signifying that it has been completed. The final mark and completed credit are also added to the user's 'Student Info' tab giving the user proper feedback that their input has been recorded.

3. The student will be able to see what courses should be taken next and can plan accordingly	[YES] The user can follow the lines connecting the recently completed course to another related course.	[YES] This visual representation shows the user which courses are prerequisites and they can plan accordingly.	[NO] The feedback for seeing which course is next is shown, but the user isn't directly notified that they can take the course aside from the checkmark beside the course from the previous step.

Walkthrough Procedure Recording

After selecting a program the application visually clutters the screen with a bunch of course boxes and lines connecting them. The **user** seems to have a **hard time understanding** what the next step they need to take is as they are being **visually overwhelmed** in that instance. The instant visual clutter after the course selection seems to be a problem for understanding what steps need to be taken next. The clarity of which courses to take next should also be clearer as a line with a simple ✓ next to the course may not be enough visual information for the user.

The user should understand what the application is for before attempting to complete the tasks. They should understand that courses have prerequisites and know that they must be completed before they move on. After completing the tasks the user should understand which courses to take in the upcoming semester.

Walkthrough Procedure Story Analysis

Success

The program is successful in conveying that a program must be selected from the top bar of the program which is labeled Program along with a suggestive dropdown icon beside it. The interface invites the user to click on the dropdown icon to select the program they are currently in the process of completing. In this case the user knows what to achieve how to achieve it and are receiving feedback that their input has been recorded.

Failure

The program fails one of the main desires of a degree planner, to make it easier to understand the requirements of their program. After the program is selected the application visually overloads the user with information and it is not clear which actions should be taken next. To remedy this reduce the amount of information the application gives the user as it should be visually streamline and easy to understand. The user also does not know the action of clicking on the courses for additional information is available, we need to make this more obvious. The user also does not understand how the application functions, adding labels to provide hints may improve this.

Cognitive Walkthrough: **Degree Calendar**

The user of the system would be a new university student which is planning on taking courses that are offered during different semesters in the first year. This allows them to have a more customized semester and having it suit their needs without compromising the completion of their program. The tasks that will be analyzed during this walkthrough are the following: planning first year semesters with lighter course loads spread between fall,winter and summer.

Walkthrough Procedure Walking

Step	Correct Action?	Notice the Action?	Feedback?
1. The student will begin by opening the application, they will have selected their desired program and the information such as courses would be displayed in the program requirements.	[YES] The user would know what action to take because the only thing available to the student would be the program tab with a drop down which allows them to select the program they are pursuing.	[YES] The user will understand how to select the course they desire from the drop down list at the top of the page.	[YES] The user will see all the courses load into the yearly blocks as well as having the program name at the top of the application.
2. The student will then click on the course in the degree requirement and select the course which they would like to take. By mousing over the course and clicking them they can see which semesters the course is offered in.	[YES] The user will see a bunch of listed courses after the they have selected their program.	[NO] An ordered list of courses appear after the program has been selected, the intuition to click them might not be obvious right away.	[YES] Once the user has clicked the course it is highlighted in yellow as well as having its information displayed in the course information block in the bottom side of the application.
3.	[YES]	[YES]	[Yes]

The student will then add blocks to the calendar to expand their semester.	The user will understand what to do at this point, as in the beginning there are only two blocks for fall and winter for the first year.	This visual representation shows the user of a large [+] sign beside the degree calendar. It suggests that the user can add onto it.	The feedback is clear in this step, as the user hits the + button a new block appears in the calendar and the user is able to label it.
4. The student will drag and drop or double click the course to place it into the planner	[YES] The user will understand that they are meant to place the courses in the calendar section of the system as it appears to hold the course blocks found in the program requirements.	[NO] The user may not understand how to place the courses into the calendar because there is nothing to indicate that it may be done by dragging and dropping or double clicking the course.	[YES] The user would be able to understand what they have done because the feedback is instant as it shows the course that moved in the calendar section of the system.

Walkthrough Procedure Recording

After selecting the program the application produces a table filled with the courses that are required to obtain the degree. The steps after are not very straightforward as there are no direct instructions to explain how the system works, not is the UI particularly helpful in this regard. The user will have to explore and poke around a bit before coming to the conclusion that they must click the courses shown in the required courses. The issue with the current design is that it is more textual, as most of the information is hidden within the course information tab. The idea behind this was to allow users to see when the courses they wanted to take were offered but it also ignores many of the other requests that were specified in the requirements analysis.

The user should understand that not all courses are available in each semester before completing the task and is trying to manage their courses so they can take some courses during the summer semester (they do not know which courses are offered). After the task has been completed the user should have planned a course load which suits their needs and will not have to worry about finishing their program on time due to their planning.

Walkthrough Procedure Story Analysis

Success

The interface is mostly understandable without any labels or textual instruction, users will understand what to do and that their interactions with the application will be driven by good feedback from the system itself.

Failure

The action of clicking on the courses doesn't come naturally, something has to be changed to provide the user with a hint that clicking / dragging and dropping the courses is the correct way to manipulate and interact with the application.

Group Decision

The group decided on choosing our first design the Degree Roadmap. This decision was fairly unanimous after the Cognitive Walkthrough. At first we discovered that the degree roadmap is extremely cluttered and there isn't much guidance to instruct the user on what to do, but we felt like the layout of this design had potential to easily show the users what they requested in the requirement analysis. Afterwards we took a look at the Degree Calendar, at first this seemed to be more easy to understand as the cognitive walkthrough was a bit more positive, most of us could navigate the prototype easily. We then listed the advantages that each design offered.

Advantages

Degree Roadmap	**Degree Calendar**
Large visual representation	Self-Built
Visual representation of restrictions	Courses are strikethroughed when completed
Easy to add marks and view stats	Easy to add marks and view stats
Flowchart easy to understand	

Disadvantages

Degree Roadmap	**Degree Calendar**
Layout is Large	Hard to understand without instructions
Extremely Cluttered UI	Mostly textual (not always bad)
Options are confusing	Having many strikethroughs when browsing required courses is confusing

After we discussed about the advantages and disadvantages of each design we noticed that most of the disadvantages of the degree roadmap were simply user interface problems as it was a mess, but because these were low fidelity prototypes these problems were easily changed. On the other hand the degree calendar's problems were not so easy to fix due to how it was designed, the calendar must be very text heavy as the primary objective that it was based around was to tell the user what options they had and allowed them to build their own schedule with the information they received. We also thought about what made each design unique, and we figured that the degree calendar does not hides the course requirements under a layer of text which is the course description itself. One of the user requirements was for visual clarity and we felt that if the Degree Roadmap was cleaned up it would encompass that ideal a lot better than the calendar would. The roadmap could also have the seasons for which a course was offered in its description box, although under a block of text. We concluded that the roadmap can provide the primary function of the calendar as well as allowing the users to visualize their progress so we chose the Roadmap.

Degree Roadmap Iteration 1

Participant 1

Initially participant was overwhelmed by the information that was displayed. The information is too cluttered and the lines between the courses is adding to the visual complexity. The course information is located on the right side of the map, the participant mentioned it is too far away and caused them to have to move their head from the left side of the screen to the right side of the screen every time they selected a course. It was hard to immediately identify the labels of the years (first year, second year...). Participant understood how to use the application but was unsatisfied due to the visual clutter and layout.

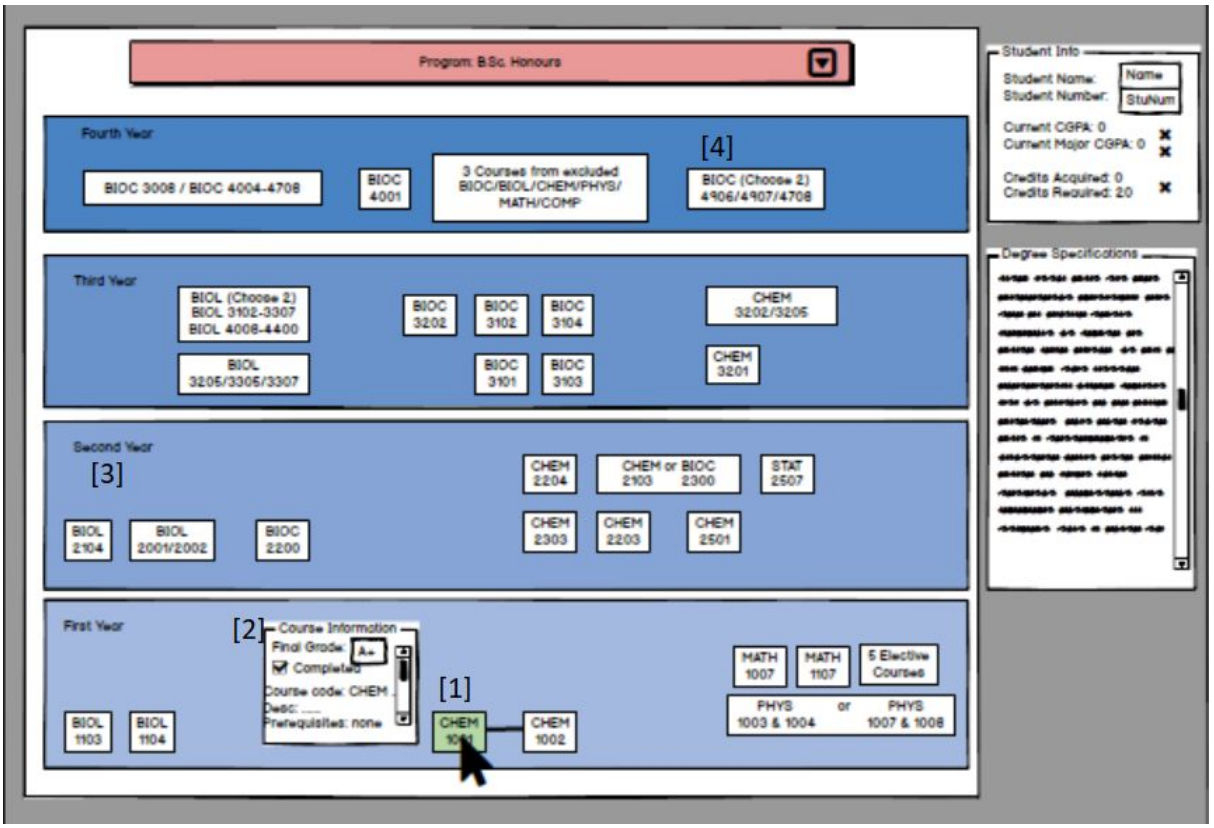
Participant 2

Participant 2 felt that the information is too close together, the spacing between objects and their connections have to be spaced out as they also found it to be quite cluttered. They did not know what to click to begin the course planning process. The participant understood after a bit of guidance. The participant mentioned that the checkmark beside a completed course adds to the visual clutter of the roadmap portion of the application. User did not like the amount of connections between the courses. Participant was unsatisfied with the experience due to the lack of visual clarity.

Participant 3

Participant 3 didn't know where to start with the course planner. Once guided they understood how the application functioned. They understood where and how to input the information. They did not like how there were inconsistencies with the application (not all the lines are straight) and the lines were crossing the yearly blocks so they were hard to read. The participant also did not like how the courses were laid out. The course blocks should be more structured and fill the blank space in the yearly blocks. Participant was unsatisfied with the experience, it was easy to understand once they knew where to begin.

Changes made for iteration 1



Change 1 - Reducing Clutter

A very common trend issue between the participants is that they felt that the UI was too cluttered there were too many lines connecting the courses. We felt that the lines were still mandatory to the application as it was important to show which courses were prerequisites for other courses. To remedy the problem we have removed the lines connecting the courses until the user clicked the course for additional information. Once clicked the course will reveal all courses that have a connection to the selected course. In C1the user has clicked the CHEM1001 shows that it is a prerequisite for CHEM 1002. The checkmark for a completed course has also been removed and has been replaced by the course turning green instead of being white. Green is a colour that symbolizes that something is correct, at a glance a user should be able to tell that this course has no problems and has been completed.

Change 2 - Moving the course description

Participant 1 mentioned that the course description is too far from the actual course. Instead of the the course description appearing on the right side of the course roadmap the course description now appears very close to the course that is selected. This makes it easy to view the course information without making the user look around the screen to find the information.

Change 3 - Clarity of the yearly blocks

Participant 1 and participant 3 have mentioned that the yearly blocks were hard to distinguish as the UI was fairly cluttered and it wasn't immediately noticeable. To increase the visibility of the yearly blocks the blocks have been given colour. The colour increases in darkness/intensity as the year increases to symbolize the difficulty of the courses. The yearly label has also been added to the block section instead of being on the outline.

Change 4 - Consistency and spacing

The courses in the yearly block have been spaced out properly to fill out the empty space of each yearly block. The information has also been grouped together to improve consistency as well as the viewing experience.

Degree Roadmap Iteration 2

Participant 1

Participant did not understand how to start using the degree planner, after initial instructions the user understood how to navigate the application. The participant understood that the colour green signified the completed course but recommended that the colours should be in a legend to clarify any misconceptions. They also noted that the yearly block label wasn't prominent enough and they recommend making it stand out more so it is easily distinguishable. Overall the participant had a satisfactory experience with the application.

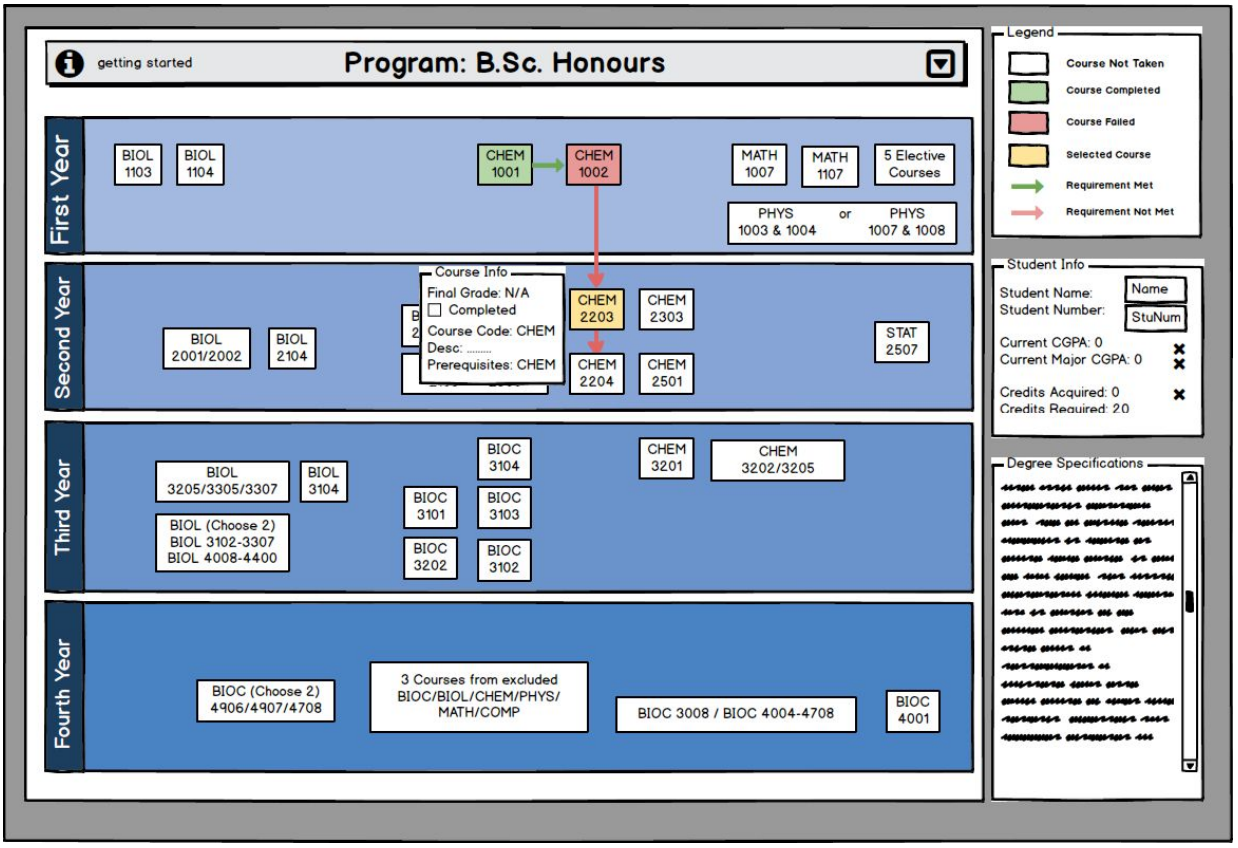
Participant 2

Participant understood how to operate the application with little instruction. The participant mentioned that the lines connecting the courses should be more informative, they also mentioned that the layout of having the fourth year at the top is a bit counter intuitive as the degree roadmap was perceived as a flowchart, which usually flows from top to bottom. The user also mentioned that a getting started info box which has a little message explaining how the application functioned would be helpful. The participant had a satisfactory experience and mentioned that aside from the initial confusion the application was easy to use.

Participant 3

Participant took a moment to familiarize themselves with the layout but understood how to navigate the system. Mentioned that the UI is pretty straightforward and the user input sections were easy to understand right away. Mentioned that when selecting a course which is close to a few other courses it is difficult to distinguish which course was selected at a glance. The user had a satisfactory experience and understood most of the interface, but had a small comment about the void space on the application in the bottom right of the system. It feels 'off' and something should be placed to fill in that spot.

Changes made for Iteration 2

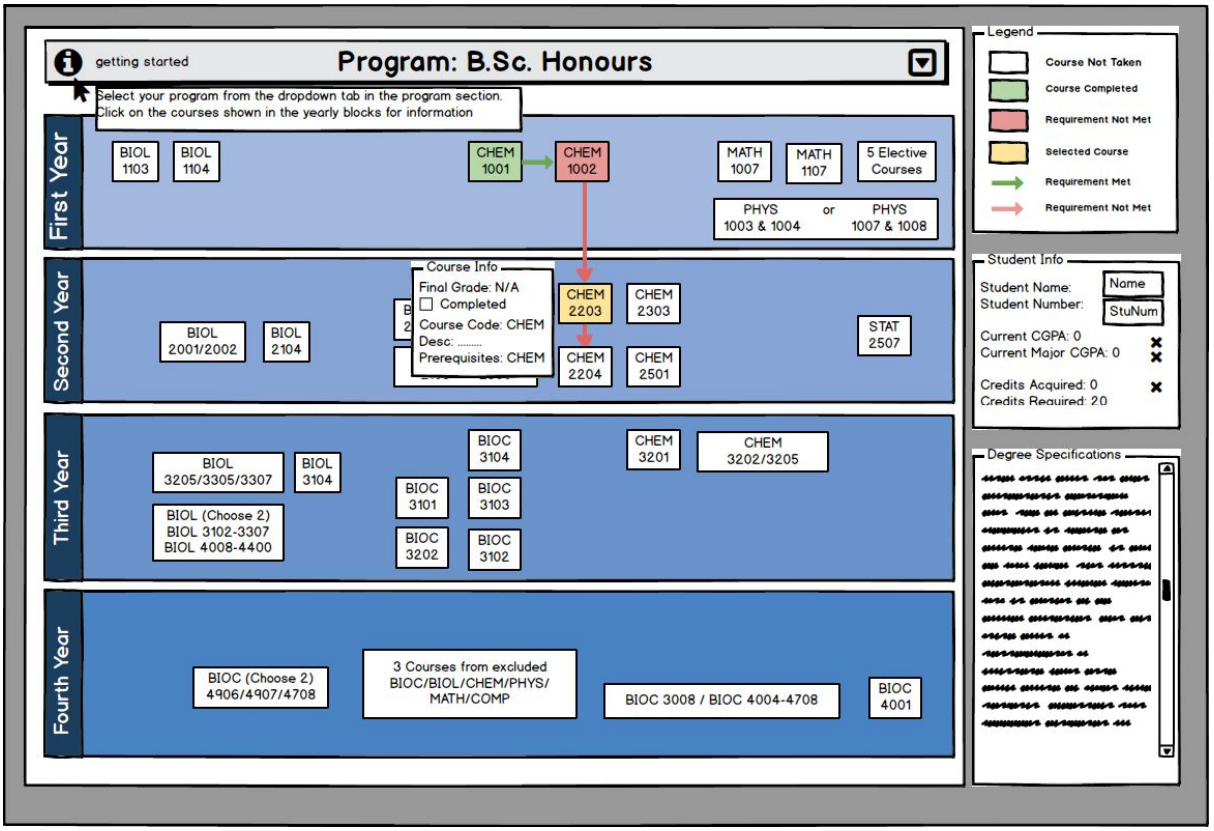


Change 1 - Clarity

Participants 1 and 3 have mentioned that the clarity of the system could be improved. Additional clarity has been added to assist the user, firstly there is now a legend on the top right side of the application to clarify any problems surrounding the meaning of the coloured objects. White course blocks are the courses that have not been taken, the green course blocks signifies that it has been completed, the red course block signifies, and the yellow course block signifies that it is the current course which is selected. The lines signifying the prerequisites have also been updated, now having an arrow indicating which course is a prerequisite for another. The arrows have also been given colour to visual communicate to the user which prerequisites have been met and which ones have not been.

Change 2 - Simple Instructions (Getting Started)

All the participants in iteration 1 and in interaction 2 had a difficult time understanding how to get started. A getting started info button has been added to the top of the course planner to explain how to use the system. The information will appear in a dialogue box after the user clicks on the info button. This will hopefully assist any new user as well as not being intrusive for any experienced user.



Change 3 - Layout

The layout of the blocks was changed to be more intuitive. The system now displays first year courses at the top and the other years in increasing order. This is more intuitive as it appears to be more of a flowchart showing which conditions have been met and which options are available from the current selection. Also made the yearly label on each block more prominent and distinguishable on the left side.

Usability Inspection Evaluation

Team briefing: the context on this evaluation is you are a second year student who just completed his first year courses and is in the process for registering for second year courses. You need to first fill out your previously completed courses and mark down your personal stats such as CGPA and Major CGPA. You will then evaluate the course roadmap and decide which courses to take next.

Process to complete these steps:

1. Select the program from the program dropdown
2. Click on the courses that have been completed and input information
3. Look at the student information on the right after the user has entered grades
4. With assistance from the course roadmap decide which courses need to be taken

Heuristic Evaluation - Angus Fan

Issue: No quick action if the user made a large error
Severity: 2
Heuristic Violated: Flexibility and efficiency of use
Description: If the user wanted to reset all of the information or let someone else quickly use the program they would need to individual uncheck and remove the mark of each course. A menu should be added with very niche functionality such as clear all courses.

Issue: The design for inputting the mark has errors
Severity: 3
Heuristic Violated: Error prevention
Description: When selecting a course there is an option to place a final grade once completed as well has being able to click on completed without leaving a mark. The user can input anything into the input box which may cause errors on how the application will calculate the CGPA/Major CGPA. To remedy this error a drop down tab can be added so the user must select from a range of marks between the range of A+ to F. The user may also not state that the course has been completed if they do not select a mark from the drop down.

Issue: The design for inputting the mark has errors - help menu
Severity: 2
Heuristic Violated: Help users recognize, diagnose, recover from errors
Description: If the change above is applied the students will not have an error message explaining what error has occurred. If a mark is marked as completed without having the grade then an error message should appear telling them that the information could not be saved because it was marked as completed without having a grade.

Issue: The icons on the student info aren't being explained
Severity: 2
Heuristic Violated: Help and documentation
Description: The x's beside the student info is not clearly stated on what it is referring to. It is not specifically telling the user that their conditions aren't met for degree completion they might think there is an error in the system. An info button can be provided to provide and explanation to a confused user.

Issue: The arrows are a bit light coloured
Severity: 1
Heuristic Violated: Aesthetic and minimalist design
Description: the arrows do not have a dark outline around them this may lead a user to have a hard time distinguishing which courses are a prerequisite for which courses.

I believe the other heuristics have a usability problem impact of 0 as the system provides sufficient feedback, speaks the user's language (they know what all these course codes are), consistency (this was addressed in iteration 1), recognition (the same layout for whichever biochemistry program is chosen), and gives the user's freedom as long as the action they perform does not create an error for the system. ie. (marked completed but no mark)

Heuristic Evaluation - David Zilio

Issue: The multi-option boxes are confusing
Severity: 2
Heuristic Violated: ease of use
Description: There are multiple boxes where several different selections can be made and the way in which they present themselves is confusing. The boxes don't effectively convey what the options are. The tree is also confusing with these elements; without selecting the optional courses the tree won't auto populate the rest of the requirements.

Issue: The degree specifications pane seems unnecessary
Severity: 1
Heuristic Violated: minimalistic design
Description: Although this section could show lots of useful, additional information everything the user needs is already available. A heavily text filled section seems like a bit of a lazy way to solve the problem of any other additional information, the design could be improved further here.

Issue: Lack of semester breakdown
Severity: 3
Heuristic Violated: functionality & usability
Description: The second system had this on the selected system. There is no way to know when the courses are offered and when you could take them. The roadmap does a fantastic job at showing the overall calendar. It fails to allow you to build your semester by semester schedule effectively. Maybe show in the box a letter to represent when it runs (F, S, W)

Issue: Only showing required courses
Severity: 2
Heuristic Violated: functionality and usability
Description: The system currently fails to show any electives or inform where there's additional space to fill in. The system does an exceptionally good job at ensuring that a student is meeting their requirements. If the students follow the usual 4 year schedule it works, otherwise things start to break. This system fails to help with scheduling, it only shows a requirements tree.

Issue: Letter grades aren't very useful
Severity: 1
Heuristic Violated: usability and aesthetics
Description: The letter grade spots could show a percentage or CGPA value to be more useful

Heuristic Evaluation - Thuvarakan Thanabalasingam

Issue: No FAQ Section or Tutorial
Severity: 1
Heuristic Violated: Error Prevention
Description: Can definitely be used to help iron out any early questions and mistakes the user may make on the website. The user may feel overwhelmed starting for the first time, as there are many tools to be used a frustrated user right off the bat will slow down their progress. A help page with either a video tutorial to show an example schedule being built or several questions with answers could be solutions. Each question asking one step to build their schedule could be answered with a small video showing how to perform the step.

Issue: The design for inputting the mark has errors
Severity: 3
Heuristic Violated: Error prevention
Description: For course selection you can place a final grade when the course is marked as completed but leaving a mark is not required when being marked as completed. With this option the user can add anything they want in the box that could create an error when calculating their grades. A solution for this is adding a strict option menu that has grades listed so they can choose the one they received. Another solution is running a small error checker to see if the input they select is valid. Adding an “OK” button to initiate the check and visually show the user what is happening.

Issue: The icons on the student info aren’t being explained
Severity: 2
Heuristic Violated: Help and documentation
Description: For the student info there are a character “x” that does not clearly state what the reference is for. The issue creates a lack of understanding to the user since they are not being informed about the conditions they are not meeting for their degree path. With the way the X is designed they might assume the website itself might have an error. A solution for this is providing an info button near the “x” so they immediately know what that issue means and show what to fix so it will leave. A simpler solution is adding an image guide in an FAQ section to inform the user if they frequently see the “x”.

Issue: No option to have more than 4 years
Severity: ~~3~~
Heuristic Violated: Efficiency of Use
Description: Although all program branches under Biochemistry are intended to be finished in four years, there are a lot of people that make want to take extend years, into the summer or another year as everyone’s pace is different. Since our design is strictly four years with two semesters each we are completely cutting off a population of students who plan differently. This is hurtful to the business side as our demographic has decreased. A solution can be an initial page asking how many semesters they want to have intotal. Also, having an automatic function that adds an extra semester upto a limit and resize the remaining the built semesters.

Consolidation

Merging and reevaluation

Issue	**Usability Impact**
No quick action if the user made a large error	2
The design for inputting the mark has errors	4
The design for inputting the mark has errors (help menu)	2
The icons on the student info aren't being explained	2
The arrows are a bit light coloured	1
The multi-option boxes are confusing	3
The degree specifications pane seems unnecessary	1
Lack of semester breakdown	2
Letter grades aren't very useful	1
Only showing required courses	2
No FAQ Section or Tutorial	1
No option to have more than 4 years	0

Explanation (for major changes)

The design for inputting the mark has errors 3->4
We discussed that this can cause the system to break

Lack of semester breakdown 3->2
This does not fit with the focus of the design of this system

No option to have more than 4 years 3 -> 0
Our design was meant to visualize the progress of course completion,
most undergrad programs are less than 5 years, no 5 year courses are offered.

Multiple of the Issues discussed focus on the system assisting with schedule design. Schedule building was not the primary focus of this prototype but could be a significant improvement moving forward.

Prioritizing

Priority	**Issue**	**Usability Impact**
1.	The design for inputting the mark has errors	4
2.	The multi-option boxes are confusing	3
3.	The design for inputting the mark has errors (help menu)	2
4.	The icons on the student info aren't being explained	2
5.	No quick action if the user made a large error	2
6.	Only showing required courses	2
7.	Lack of semester breakdown	2
8.	No FAQ Section or Tutorial	1
9.	Letter grades aren't very useful	1
10.	The arrows are a bit light coloured	1
11.	The degree specifications pane seems unnecessary	1
0.	~~No option to have more than 4 years~~	~~0~~