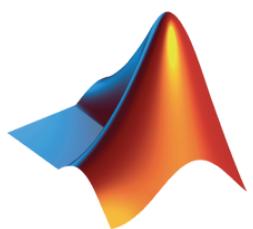


UW AFT 2024 HACKATHON

UW AFT



MathWorks®



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LAND ACKNOWLEDGEMENT

“The University of Waterloo and the University of Waterloo Alternative Fuels Team (UWAFT) acknowledges taht much of our work takes place on the traditional territory of the Neutral, Anishinaabeg, and Haudenoseanee peoples. Our main campus is situtation on the Haldimand Tract, the land granted to the Six Nations that includes six miles on each side of the Grand River. Our active work towards reconciliation takes place across our campuses through research, learning, teaching and community building, and is coordinated within the Office of Indigenous Relations.”



T U N D O C O D E O F C O D E

UWAFT **HACKATHON 2024** CODE OF CONDUCT

Compete with enthusiasm, and always respect others.

Embrace diverse ideas and backgrounds—everyone's voice matters.

Compete fairly—honor the rules and your integrity.

Share knowledge and encourage each other's learning.

Listen with empathy and offer constructive feedback.

Hold yourself and others accountable for respect and fairness.

Celebrate success and learn from challenges with grace.

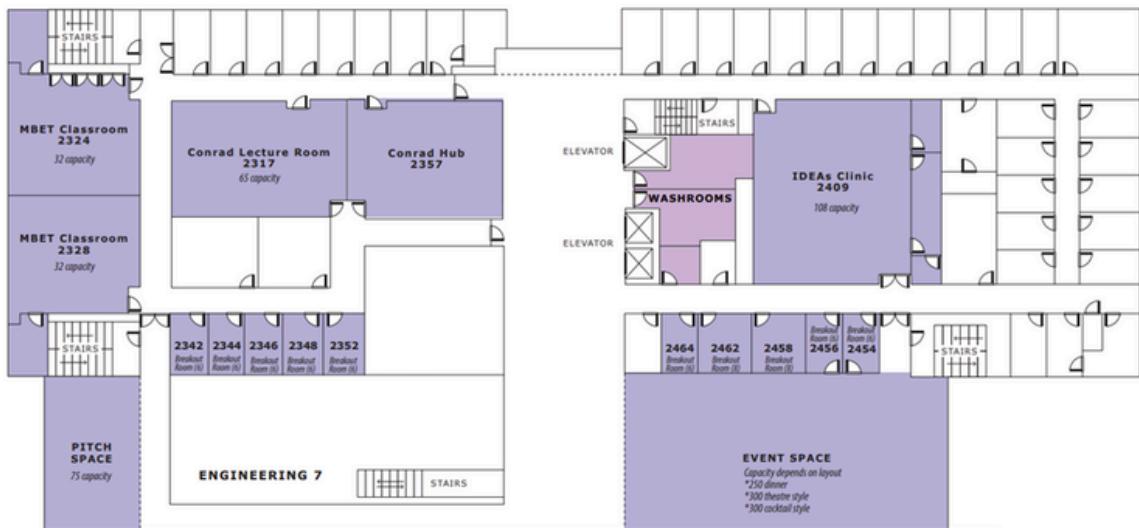


LOCATION INFORMATION



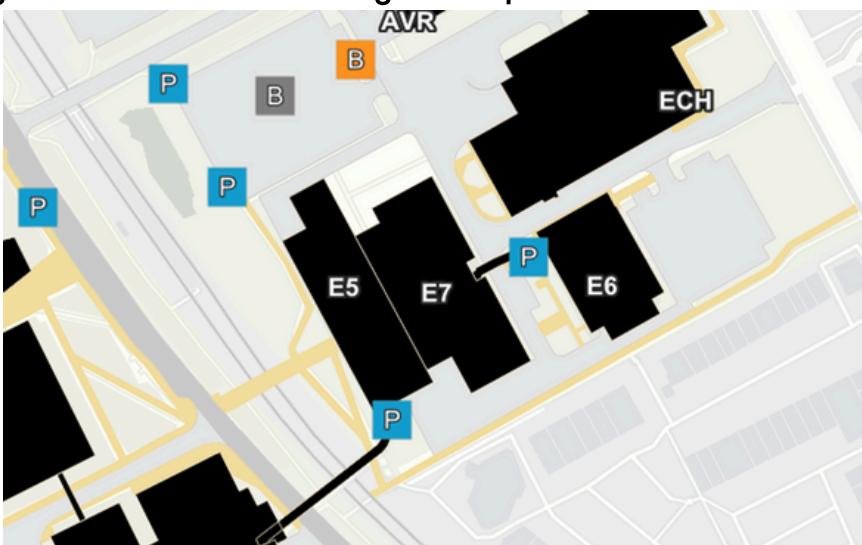
Location:

University of Waterloo E7 - 2nd Floor Event Space
200 University Ave W, Waterloo, ON N2L 3G5



Parking (\$7/ day)

Parking Lot B - access through Phillip Street



FIRE/EVACUATION

In case of fire

1. Leave fire area and close doors.
2. Activate wall mounted fire alarm pull station located at exits.
3. Attempt to extinguish fire only if you can do it safely.
4. Report any information about fire to the Fire Department and UW Special Constable Service.

If you are on fire

STOP where you are, **DROP** to floor or ground and **ROLL** your body to smother the fire.

When fire alarm sounds

1. Calmly evacuate the building. **Do NOT use elevator.**
2. As time allows close windows and doors. Turn off cooking, electrical and laboratory equipment. Put on coat in winter if time permits.
3. Use an alternate exit, if you encounter smoke or fire.
4. Follow instructions of emergency responders and fire wardens.
5. Report the location and detail of anyone suspected of remaining in the building.
6. Move away from building at least 30 metres, leaving clear access for emergency services.
7. Do not re-enter the building until authorized by Fire Department or UW Special Constable Service.

If unable to evacuate

1. Call 911 to give your location.
2. A closed door can provide good protection against fire and smoke. Use available materials to seal door and air ducts.
3. Signal your position at a window.
4. If smoke enters room, stay low as heat and gases tend to rise.

Persons with mobility difficulties or who use wheelchairs should move to an area of refuge (stairwell, room with phone).

Controlled evacuation

In non-fire situations threatening safety, such as building services interruption or hazardous material spill, buildings are evacuated under direction of UW Special Constable Service, fire wardens and emergency response services. The fire alarm should not be used to evacuate a building without approval.

Hazardous material spill

UW Special Constable Service

519-888-4911 or ext. 22222

Fire/Evacuation Training and Information:

Safety Office (Commissary Building)

uwaterloo.ca/safety-office

safety@uwaterloo.ca or ext. 33587

Fire Equipment Service:

Plant Operations ext. 33793

Fire code requirements

1. Open flames, including candles, are not permitted in buildings except as part of lab apparatus, approved food services and maintenance/construction approved by Plant Operations.
2. Bicycles are not allowed in buildings, except in approved designated locations.
3. Corridors and stairwells must be free of obstructions and any combustible or flammable materials. Items located in a corridor or stairwell must be approved by Plant Operations.
4. Self-closing doors must be able to close. Wedges are only permitted as a temporary measure to hold doors open while attended.
5. Fire safety equipment including exit signs, fire extinguishers, and fire hose cabinets must be kept unobstructed.

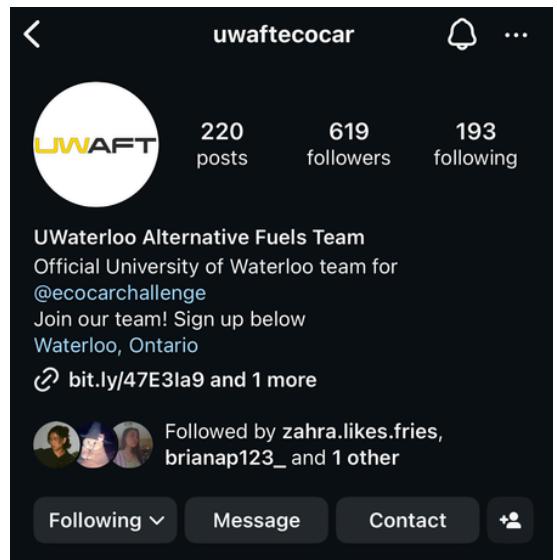
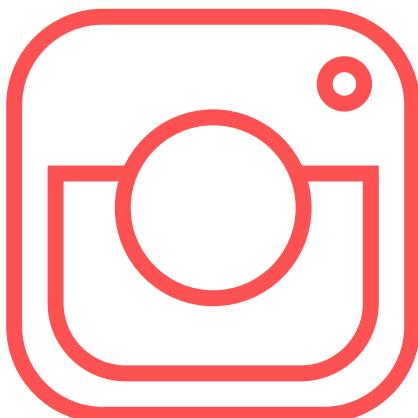
Willful fires, false fire alarms and tampering with fire equipment are offenses under the law.

SOCIAL MEDIA CONTENT TEST



Enter to win raffle prizes!

Insta: @uwaftecocar



How it works:

1. **Follow us** = 1 entry
2. Comment on one of our posts = 1 entry
3. Post a pic of our event = 2 entries
 - a. Use **#UWAFTHacks**
 - b. Tag **@uwaftecocar** so we can see it
4. You can comment and post as many times as you want!

8:30 WELCOME & BREAKFAST!

- 8:50 - Safety Overview
- 9:00 - Opening Key note speaker - Dr. Teertstra
- 9:20 - Hackathon problem Overview

9:45 LESSON 1 - THE ENGINEERING DESIGN PROCESS

- 9:45 - Introduction to the design process - Dr. Bedi
 - What are the steps of the design process?

10 LESSON 1 - LETS TRY IT TOGETHER

- Customer Problem Statement
- Going Broad to Narrow

10:30 LESSON 2 - DESIGNING AND PROTOTYPING

- 10:30 - Designing and Prototyping - Dr. Li
 - What is designing? What is prototyping? How do we do it?

11:00 TOURS & LUNCH

- 11:00 - Group Blue - Return @ 12:35
- 11:15 - Group Yellow - Return @ 12:50
- 11:30 - Group Red - Return @ 1:05
- 11:45 - Group Green - Return @ 1:20

1:30 LESSON 3 - KEEPING ACCESSIBILITY IN MIND

*By this time groups should:

- you shoudl have your problems/ solutions identified - think about accessibility
- Have started their CODING portion
- 1:30 - Developing an App with Accessibility in mind - Dr. Munteanu

2:45 LESSON 4 - TESTING YOUR PROTOTYPE & WIREFRAMING

- 2:45 - Prototype testing
 - Groups must test with a minimum of 2 users

4:30 LESSON 5: PITCHES AND PRESENTATIONS

- 4:30 - How to make an effective presentation and “Elevator pitch”



INVENTORY



5:30 COMPETITIONS SUBMISSIONS ARE DUE

- 5:30 - Submit the following in respective “GITHUB Fork Repositories”

5:45 PANEL - ENGINEERING IN THE AUTOMOTIVE INDUSTRY

- 15 minute panel
- 10 minute Q&A period
- Guest Speakers:
 - GM - Mr. Joshua Lo
 - GM - Mr. Patrick DiGioaccino

6:30 PANEL - DEI IN STEM

- 20 minute panel
- 10 minute Q&A period
- Guest Speakers:
 - Waterloo - Dr. Fowler
 - UWAFT DEI Lead - Pamela Campos-Ordonez
 - Waterloo Student and President of NSBE - Khali Abdi
 - Member of Parliament - Bardish Chagger

7:10 KEYNOTE PRESENTATION

- What it means to be an engineer!
- Guest speaker: Dr. Fraser

7:30 AWARDS AND CEREMONY

- Awards will be presented to the top two teams of the hackathon
- Please refer to the task and rubrics page for more information

7:50 GROUP PICTURE & GOODBYES

GUEST SPEAKERS



DR. PETER TEERTSTRA
UW PROFESSOR
OPENING KEYNOTE



DR. SANJEEV BEDI
UW PROFESSOR
LESSON 1



KHA VI AN TRAN
UWAFT COMMS
ACTIVITY



DR. EUGENE LI
UW PROFESSOR
LESSON 2



DR. COSMIN MUNTEANU
UW PROFESSOR
LESSON 3



SKYLER NAM-WONG
UWAFT PM
LESSON 4



SAKSHI SHARMA
ULAURIER - MBA
LESSON 5



PATRICK
DIGIOACCHINO
GENERAL MOTORS
PANEL - AUTO & ENG



JOSHUA LO
GENERAL MOTORS
PANEL - AUTO & ENG



PAMELA CAMPOS-ORDONEZ
UWAFT EIM
PANEL - DEI & STEM



DR. MICHAEL FOWLER
UW PROFESSOR
PANEL - DEI & STEM



FRANK
ROLE
PANEL - DEI & STEM



KHALI ABDI
UW STUDENT & NSBE
PRESIDENT
PANEL - DEI & STEM



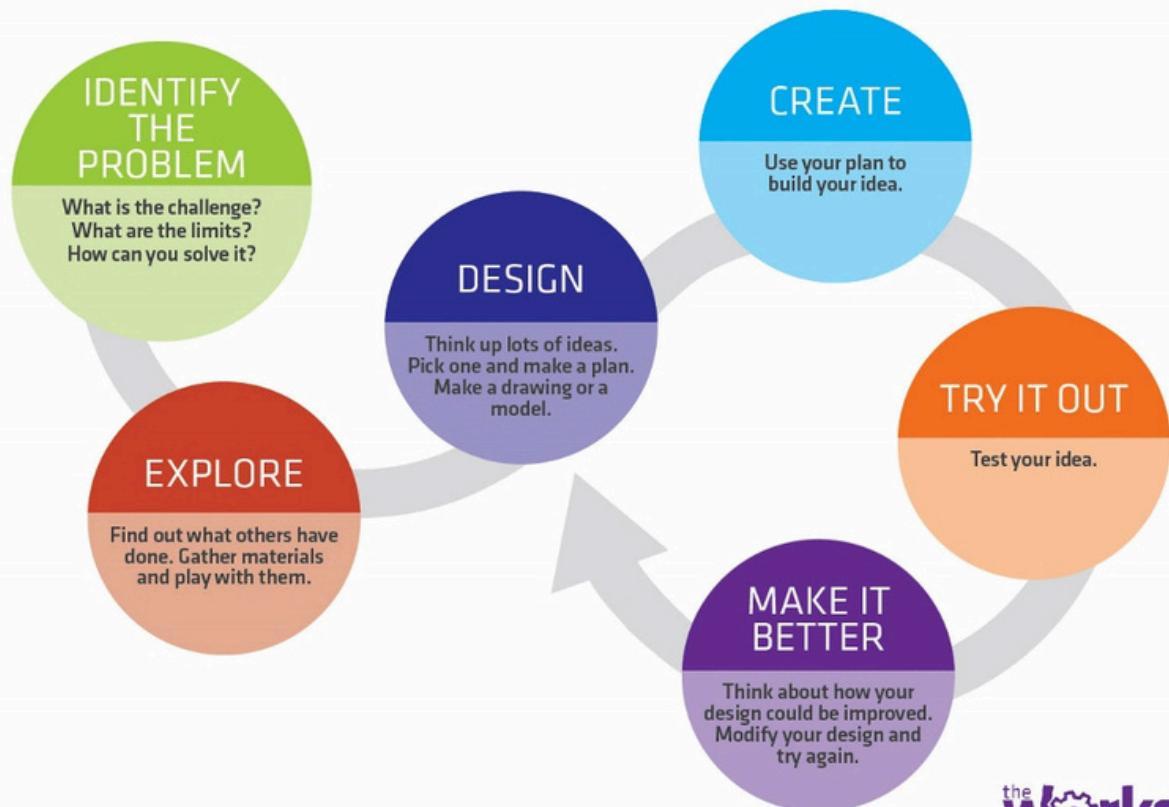
HONOURABLE
BARDISH CHAGGER,
P.C.
M.P FOR WATERLOO
PANEL - DEI & STEM



DR. ROYDON FRASER
UW PROFESSOR
PEO COUNCILLOR
KEYNOTE CLOSER

THE ENGINEERING DESIGN PROCESS

ENGINEERING DESIGN PROCESS



Engineers use the Design Process to create something new or make something better.

the worksTM
museum
Engineering Fun

the-works.org

The engineering design process is a systematic, iterative approach used by engineers to solve problems and create innovative solutions. It typically involves key steps such as identifying and defining the problem, conducting background research, brainstorming ideas, selecting the most feasible solution, prototyping, testing, and refining the design based on feedback. This process is essential because it promotes critical thinking, creativity, and problem-solving skills while ensuring that solutions are practical, efficient, and meet user needs. By following this structured approach, engineers can minimize risks, optimize performance, and continuously improve designs, ultimately leading to more reliable, effective, and sustainable innovations in fields ranging from technology and infrastructure to healthcare and environmental solutions.

Our hackathon simulate the rapid, iterative cycle of the engineering design process, encouraging critical thinking, teamwork, and practical application of engineering principles, making it an excellent way to engage youth in STEM and problem-solving.



GETTING STARTED

GITHUB

- 1. Create an account on GITHUB**
- 2. Have 1 representative of your group click this link: [UWAFT Repository](https://github.com/khavian/UWAFT-Highschool-Hackathon--2024/tree/main)**
 - a. (<https://github.com/khavian/UWAFT-Highschool-Hackathon--2024/tree/main>)
- 3. One person from each team will FORK the repository**
 - Click the "Fork" button in the top-right corner of this repository.
 - This creates a copy of the repository in your GitHub account.
- 4. Add your team members in your folders**
 - Go to settings
 - Click "collaborators" on the top left side (under General and Access)
 - In Manage access - click "Add people"
 - In "Find people", type in your team members Github account names OR their emails (associated with Github)
 - Click Select Collaborator (make sure that it is your teammate)
 - Click the green button "Add _NAME to this repository"
 - ALL YOUR TEAMMEMBERS HAVE ACCESS TO THE GITHUB
- 5. Change the title of your Github Folder**
 - Go to setting (top right)
 - Go to General
 - Change "Repository name" to "Group_[YourGroupLetter]_UWAFTHackathon_2024"
 - Example: Group_A_WATERLOO_UWAFTHackathon
- 6.. Ensure that your folder is PRIVATE during work time**
 - Go to "Settings"
 - Go to "Collaborators"
 - Under the "Who has access" section - click "Manage"
 - Scroll down to the "Danger Zone"
 - Click "Change Repository visibility"
 - Select Private
 - Follow prompts to confirm
- 7. When Submitting convert your folder back to PUBLIC**



GETTING STARTED

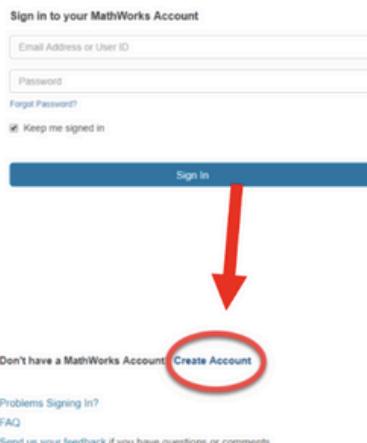
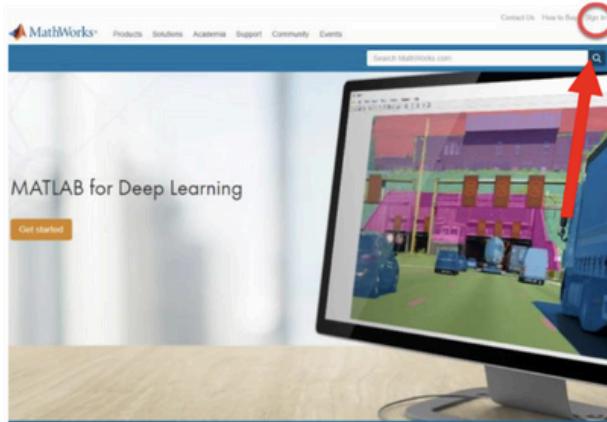
MATLAB



Getting Started with MATLAB

1. Create a MathWorks account

- Go to <https://www.mathworks.com/>
- Click 'Sign In' in the upper right corner of the page
- Click 'Create Account'
- Fill out page and then press 'Create'



2. Access MATLAB Online

- Go to <https://matlab.mathworks.com/>
- Log in Using MathWorks account created earlier

MATLAB Mobile™

Obtaining your Mathworks License

1. Click this link: [Mathworks License](#)
2. Click on "Access MATLAB" - The license will automatically be associated with your Mathworks account!
3. NOW YOU CAN CODE ON MATLAB!



THE TASKS AT HAND

YOU ARE A START UP COMPANY! YOU AND YOUR TEAM HAVE TO COMPLETE THE FOLLOWING TASKS:

1

MARKET RESEARCH AND PRODUCT DEFINITION

2

DESIGNING THE EXPERIENCE OF YOUR APPLICATION

3

DEVELOP THE MODEL (CODING)

4

USER TESTING AND DESIGN ITERATION

5

VIDEO & REFLECTION OF YOUR APPLICATION

6

PRESENT TO INVESTORS



ROLES

WHILE EACH ROLE HAS SPECIFIC TASKS, THEY MUST WORK TOGETHER AS A TEAM TO ENSURE UNITY IN THEIR VIDEOS, PRESENTATIONS AND FINAL PRODUCTS.

IN GROUPS OF 3 TO 6, STUDENTS ARE TO FULFILL THE FOLLOWING ROLES:

1 PRODUCT MANAGER

RESPONSIBILITY: RESEARCH THE MARKET AND DEFINE YOUR PRODUCT

2 UX DESIGNER

RESPONSIBILITY: DESIGN THE USER EXPERIENCE OF YOUR APPLICATION

3 DEVELOPER

RESPONSIBILITY: DEVELOP FEATURES OF YOUR APP
(ENCOURAGED TO USE THE MATLAB EXAMPLE)



APPLICATION STRATEGY



Task 1: Market analysis and strategy

(PDF - 2300 word maximum, single spaced, 11 times new Roman, indicate word count, APA referencing)

"UWAFTSubmission_Task1_GROUP LETTER SCHOOL_2024"

Objective:

Your task is to analyze and plan the strategy for your application by conducting essential business and customer evaluations. This includes identifying the target audience and their key problem, ideating features to solve their problem, performing SWOT analyses, recognizing potential competitors and investors, and incorporating accessibility features. **This task requires you to:**

1. Determine your target and delivery method

- Define your customer problem statement.
- What is the market size of your audience? How could this impact the success of your company's entry?
- Specify the delivery method (phone, computer, or both).
- Provide a clear and justified explanation of why this audience and delivery method were chosen.
- Be sure to clearly justify your delivery method.
 - "We chose platform x as audience y is more likely to be using this because..."

2. Determine your solution

- Describe **THREE** features of your app that will solve your customer's problem - think broad to narrow.
- Explain why you chose the specific features on your application.
 - One feature must be the MATLAB feature - *Steps Taken*.
 - The other two features are your team's choice.

3. SWOT Analysis

- Perform a SWOT analysis that includes:
 - Strengths: What gives your application an advantage?
 - Weaknesses: What areas need improvement?
 - Opportunities: What market opportunities can you leverage?
 - Threats: What external factors could impact your success?

4. Competitors and Investors

- Identify 3 potential competitors and briefly explain how they compare to your application.
- Identify 3 potential investors and justify why they would be interested in funding your application.

5. Accessibility Features (visual aids are encouraged)

- Include at least 2 accessibility features.
- Explain why these features are important for your target audience.

6. Create your "Product Specification" document (template below)

- Be as concise as possible.

Product Specification Template

Task 1: Application Strategy Analysis



<u>Feature</u>	<u>Function</u>	<u>Impact on user and their problem</u>
MATLAB Feature	Converts GPS data to steps taken	FILL THIS IN - it depends on your target user and their problem!
"Team Choice Feature 1"		
"Team Choice Feature 2"		
"Accessibility Feature 1"		
"Accessibility Feature 2"		

UWAFT APP SUBMISSION RUBRIC

APP ANALYSIS AND STRATEGY - RUBRIC

/20 CHANGE THIS

"UWAFTSUBMISSION_TASK1_GROUP_LETTER_SCHOOL_2024"

Category	4 Points (Excellent)	3 Points (Good)	2 Points (Needs Improvement)	1 Point (Poor)
Target Audience and Delivery Method	Clearly defines the customer problem, target audience, and market size; delivery method is well-justified.	Defines customer problem and target audience; delivery method is justified.	Target audience or delivery method lacks clarity or detail.	Customer problem or delivery method is unclear or missing.
Solution and Features	Describes 3 well-chosen features (including MATLAB feature) with clear explanations of how they solve the problem.	Describes 3 features with some explanation; connections to problem could be clearer.	Features lack detail or relevance to solving the customer problem.	Features are unclear, incomplete, or missing.
SWOT Analysis	Thorough SWOT analysis with relevant and insightful Strengths, Weaknesses, Opportunities, and Threats.	Clear SWOT analysis; some elements lack detail or depth.	Basic SWOT analysis; limited relevance or depth in some areas.	SWOT analysis is incomplete or lacks relevance.
Competitors and Investors	Identifies 3 competitors and 3 investors with clear, justified comparisons and rationale for investment.	Identifies competitors and investors with basic comparisons and rationale.	Competitors or investors identified, but explanations lack clarity or detail.	Competitors and investors are unclear or missing.
Accessibility Features	Includes 2 well-integrated accessibility features with clear explanations of their importance for the audience.	Includes 2 accessibility features with basic explanations.	Mentions accessibility features but lacks clear explanations.	Accessibility features are unclear or missing.



DETERMINING YOUR AUDIENCE AND TARGET CUSTOMERS

How to effectively define a product with high value:

You always want to know exactly WHO you are targeting, WHAT they are struggling with, HOW your product is helping them. You should also justify WHY you chose this as your business model.

STEP 1 - Think of problems

- Practice empathy to get a better understanding of our users needs, experiences and motivations.
 - Get to know your prospective customers
 - Walk in their shoes and identify their pain points
 - Understand the needs they can't articulate
 - **Don't look for solutions, look for problems**

STEP 2 - Create a Customer Problem Statement

The most important thing to agree on as a team is the customer problem you are solving. A customer problem statement frames a true customer problem in their own words while addressing the size of the problem through emotion. It should be **clear, relatable and understandable.**

Template:

I am: (A narrow description of the customer **NOT YOU!** that highlights their motivations, attributes and/or characteristics)

I am trying to: (desired outcome)

But: (problem/barrier)

Because: (root cause)

Which make me feel: (emotion)

STEP 3 - Ideate MANY solutions

- You already know you're creating a fitness app - but what are the features of this app?

Go broad

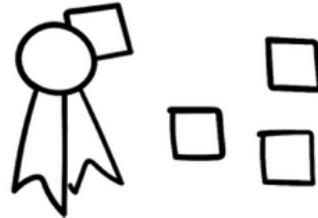
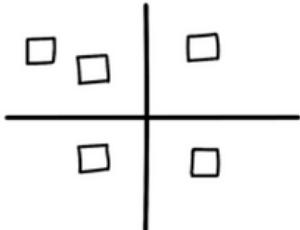
To come up with a great idea, first come up with lots of ideas.

- **Utilize diverse personalities from across your organization or peer group**
- Keep the activity rooted in the customer problems uncovered through your empathy exercises and data

DETERMINING YOUR AUDIENCE TARGET

STEP 4 - Organize your solutions (ie. features) through prioritization exercises

- Always think of the value to your customer problem!
- Make sure to consider the value from a business perspective as well (Is it possible? Is it worth it?)



2 x 2

A 2x2 is a matrix with criteria you can stack your ideas against. You will determine the criteria - Examples: Innovative vs Commonplace, Impact or Customer Benefit, High Cost vs Cheap. The ideas in your top right quadrant are your priority.

100 points

Best used in support of another prioritization method (e.g. 2x2), put ideas to a vote and allow your team to allocate their 100 pts among the ideas.

This method is an aid to judgment, not a replacement to judgment. Do you best to **focus on the customer-backed decision criteria**, not your opinion or what will be easiest to build.

STEP 5 - Based on the results of Step 4, pick your two best features

Go narrow

Do less better: focus on the solution that will deliver the greatest customer benefit.

- Prioritize biggest impact and least effort (be scrappy)
- These will be the features of your app
 - **Note:** You will have an additional feature already defined by MATLAB - Steps Taken

STEP 6 - Repeat this idea generation but with ACCESSIBILITY in Mind!

- Based on your research, what kind of accessibility issues could users of your target audience face?
- Define an additional **2 features** to accommodate for your user's potential accessibility needs.

UWAFT TASK 2: DESIGNING AN APP



Task 2: Designing a fitness Application (minimum 8 “panels”)

1.5 minute MAX video submission **Type: MP4**

“UWAFTSubmission_Task2_GROUP LETTER SCHOOL_2024”

Objective:

It is time to take your idea and transform it into a real experience. Your task is to roughly design your app through a paper prototype. You don't need to be too detailed here!

Step 1: Using a pen and paper, ipad, or whatever tool you want for drawing, roughly draw out each screen of your application.

- Your design should clearly show the flow of your app as well as the function of your features.

Step 2: When you have completed your design, record a video (1.5 minute maximum) of the entire experience. Show the entire flow of your design (i.e. which button leads to which screen, which feature does what). As you go through the design you must also include:

- Explanations for each feature, emphasizing their purpose and functionality.
 - Check for Depth: Ensure each explanation covers not just what the feature is, but why it works as a part of this experience - always think back to the customer problem

[Example of Paper Prototype Design](#)

PRESSENTATION RUBRIC: VIDEO (UX DESIGN & FLOW)- RUBRIC



VIDEO (UX DESIGN & FLOW)- RUBRIC

/20

"UWAFTSUBMISSION_TASK2_GROUP LETTER SCHOOL_2024"

Category	4 Points (Excellent)	3 Points (Good)	2 Points (Needs Improvement)	1 Point (Poor)
Prototype Design and Layout	All key screens are drawn clearly; app flow is easy to follow and well-structured.	Most key screens are drawn clearly; app flow is mostly understandable.	Some screens are missing or unclear; app flow is difficult to follow.	Screens are incomplete or unclear; app flow is confusing or missing.
Feature Clarity and Functionality	Features are clearly illustrated with well-defined functions and smooth flow between screens.	Features are illustrated well, but some functions or flow could be clearer.	Features are present but lack clarity or detail in their functionality.	Features are unclear, incomplete, or missing.
Explanations of Features and Design Choices	Thorough explanations of features and design choices; clear reasoning behind each decision.	Clear explanations with some reasoning for design choices.	Basic explanations; limited reasoning for design choices.	Explanations are unclear or missing; no reasoning for design choices.
Depth of Explanation and User Focus	Explanations connect features to solving customer problems; shows deep understanding and user focus.	Explanations connect features to customer problems but lack depth.	Explanations are basic with limited focus on customer problems.	No clear connection between features and solving customer problems.
Integration of Accessibility Features	At least 2 accessibility features are integrated seamlessly with strong rationale for inclusion.	Accessibility features are present but rationale is basic or incomplete.	Accessibility features are mentioned but lack integration or clear rationale.	Accessibility features are missing or poorly explained.

UWAFT

Task 3.1: Coding and Explanation

Task 3.1: Coding and Explanation

MATLAB Code

"UWAFTSubmission_Task3.1_GROUP LETTER SCHOOL_2024"

Objective:

Your design is complete! Now it is time to actually develop the app. We will start by developing the model for your first feature - *Steps Taken* (provided by Matlab). The code for this feature has already been provided to you, however you must replicate the code and run it yourself, as well as be able to explain the code thoroughly. You will then get a chance to conceptualize how you would develop a feature of your own.

Tips:

- Some of you may be familiar with Matlab, while others may be completely new to it. If you are unsure how to navigate the software, KNOWLEDGE IS ALL AROUND YOU!
 - Leverage the resources available to you - be it documents, tutorials, or other people. Even if you are doing something for the first time, part of being an engineer is facing entirely new challenges and creatively problem solving to overcome them.

For this task, you must:

1. Replicate the code using the example guide provided
 - You will notice a file labelled "Matlab Example Guide.pdf". This file provides the fully functioning code to your first feature - *Steps Taken*.
 - Referring to this file, replicate the code on a new file of your own and successfully run it.
 - Feel free to make adjustments or play around with the code to make it better!
2. Explain the purpose/function of each block of code
 - We are looking for thorough explanation of what each block of code is doing.
 - Ensure explanations cover the logic, structure, and purpose of the code.
 - The more granular and detailed you can be, the better. You don't always have to be right - we are interested in the process!



UWAF

Task 3.2 : Coding Conceptualization

Task 3.2 : Coding Conceptualization

PFD - maximum 750 words

"UWAFTSubmission_Task3.2_GROUPLETTER_SCHOOL_2024"

Objective:

Now that you saw how a real model works in an application, reflect on how you would integrate your own model in your application. How would you develop a feature of your own? **For this task, you must:**

1. Conceptualize how you would develop another feature of your app
 - Choose another one of your app features and discuss the approach and steps you would take to develop the model for this feature.
 - You aren't required to actually code this additional feature! You are only expected to explain HOW you would develop it conceptually.
 - Include a discussion on:
 - What data the model will be collecting.
 - How could you collect this data.
 - How would you present the results of your model.
 - Why you chose this coding convention
2. Explain the architecture of your app
 - Let's imagine you've successfully developed your selected feature and it works! But when does your code actually run within the app?
 - Provide an explanation, referring to the design of your app created by your UX Designer.
 - At what point does the model you have developed actually runs within the app.
 - At what point does the model you have developed actually stop within the app?
 - Why did you chose these starting and ending points?



Task 3: Coding and Explanation Rubric



CODING AND EXPLANATION PDF- RUBRIC /20

“UWAFTSUBMISSION_TASK3.1_GROUP LETTER SCHOOL_2024”

“UWAFTSUBMISSION_TASK3.2_GROUP LETTER SCHOOL_2024”

Category	Excellent (5 pts)	Good (4 pts)	Needs Improvement (3 pts)	Poor (2-0 pts)
Code Replication and Execution	Code is accurately replicated and runs successfully; adjustments show creativity and understanding.	Code is accurately replicated and runs successfully; minor adjustments made.	Code is replicated but contains minor errors; limited or no adjustments.	Code is incomplete or does not run successfully.
Explanation of Code Blocks	Each block of code is thoroughly explained with clear logic, structure, and purpose; highly detailed.	Most blocks are explained clearly; minor gaps in logic, structure, or detail.	Some blocks are explained, but explanations lack clarity or completeness.	Explanations are missing, unclear, or incorrect.
Conceptual Model Development	Clear and detailed approach to developing a new feature; data collection, presentation, and coding conventions are well explained.	Approach is clear with some detail; data and coding conventions are addressed.	Basic approach; some explanation of data and presentation; lacks detail.	Approach is unclear or missing; little to no explanation of data or conventions.
App Architecture Explanation	Clearly explains when the model starts and stops within the app; rationale is well-justified and detailed.	Good explanation of model execution points; rationale is present but basic.	Execution points mentioned but rationale lacks clarity or detail.	Execution points are unclear or missing; no rationale provided.



Task 4: UX Testing and Reflection

(2000 maximum, single spaced, 11 Times New Roman, ensure clear headings, 2 page Appendix max)

"UWAFTSubmission_Task4_GROUP LETTER SCHOOL_2024"

Objective:

Now that you have created your design, it is time to test it with real users. How can you be certain your customers will enjoy the experience of your app if you never had them try it? You may understand the flow of your app, but what if your customers find it hard to navigate? It is crucial to have your app seen through your user's eyes so you can make changes to the design before heavily investing in the app's development. **The task includes:**

1. Develop a testing plan for testing your design

- Prepare tasks that you will probe your users to perform using your paper prototype.
- Prepare a list of questions you will ask your users during the test for feedback on the experience.
- Establish how you will be documenting observations and responses throughout the test.
- Describe how the test will be conducted. Who is responsible for what?

2. Conduct the test with 2 users

- Make sure to refer to your testing plan as you run your tests!
- Pay particular attention to areas you notice users struggling with.
- Remember to think about WHO your target audience is!

3. Consolidate feedback

- With your tests complete, consolidate your feedback and highlight the key points that were uncovered.
- Describe actionable suggestions and changes you can make to your design based on this feedback.

4. Implement the changes

- Now that you know which areas of your design need to be improved and how to improve them, make the changes to your prototype!
- Sometimes it isn't always worth making the changes if they are unrealistic or provide low value. It is up to you to decide what changes you want to implement based on your user's needs.

GUIDE TO USER TESTING

Task 4: User Testing

Instructions:

STEP 1 - Send one teammate to the group beside you. This teammate will be acting as the user participating in that group's test of their design

- As the user participating in the test. It is CRUCIAL that you voice out loud all your thoughts and actions.
- It may feel silly, but it is critical for the testers to understand your thought process as you are going through THEIR design. For example:
 - "This button looks big so I'm going to press it. Ah it brings me to a new page! This page seems very cluttered and is hard to look at..."

STEP 2 - Run your test with the user that has come to your group!

- Try to always question why your user has made a decision. For example:
 - What prompted you to press this button?
 - What were you expecting to see happen by clicking this?
- Try your best NOT to help your user or give them answers unless they are completely stuck.
 - The purpose of testing is to see how your users will interact with your design on your own. If they are struggling with something, that is a good indicator that the design needs to be improved there.

[Example of User Testing](#)

TASK 4 : RUBRIC TESTING & REFLECTION



UX TESTING AND REFLECTION PDF - RUBRIC /20

"UWAFTSUBMISSION_TASK4_GROUP_LETTER_SCHOOL_2024"

Criteria	4 Points	3 Points	2 Points	1 Point
Develop a Testing Plan	Comprehensive plan with clear user tasks, feedback questions, documentation method, roles, and procedure.	Plan covers tasks, questions, documentation, and roles, but lacks detail in one area.	Plan is missing details or clarity in multiple areas.	Incomplete or unclear plan, missing key components.
Conduct the Test with 2 Users	Tests conducted thoroughly and consistently with 2 users; observations and feedback are well-documented and relevant to the target audience.	Tests conducted with minor inconsistencies; feedback and observations are mostly clear.	Tests have significant issues; feedback or observations are incomplete or lack clarity.	Poorly executed tests; feedback and observations are missing or irrelevant.
Implement Changes	Relevant changes made based on feedback; clear rationale provided, with noticeable design improvement.	Changes address feedback but lack full effectiveness or detailed rationale.	Minimal changes with limited rationale or improvement.	Changes are unrealistic, irrelevant, or no changes made; rationale is missing.
Consolidate Feedback	Clear summary of key insights; actionable suggestions prioritized effectively and presented in an organized manner. (8 points)	Feedback summarized with some insights and suggestions, but lacks prioritization or clarity. (6 points)	Limited summary or suggestions; organization and prioritization are weak. (4 points)	Feedback is unclear, disorganized, or missing key insights and suggestions. (2 points)



Objective:

Based on the results of your user testing and their feedback, you will create **2 submissions**:

Task 5.1: Video of Improved UX Design

(1.5 minute video maximum) **Type: MP4**

"UWAFTSubmission_Task5.1_GROUP_LETTER SCHOOL_2024"

Video demonstration and Explanation of Changes - Record a video that once again goes through the flow of your design, explaining all features, however this time also including:

- Explanations of all the changes made from your original prototype:
 - Ex. "This used to be like this, but based off the results of our user tests, we now have _____ because _____"

Task 5.2: Wireframe of Final UX Design

(Photo) **Type: PNG or JPEG**

"UWAFTSubmission_Task5.2_GROUP_LETTER SCHOOL_2024"

Image of your wireframes - Provide an articulated visualization of the overall design flow

- More details to be shared on the next page

WIREFRAMING EXAMPLE



What is Wireframing?

Wireframing is the process of creating a visual blueprint or skeleton of a design interface. It focuses on the basic structure and layout of a design focusing on how different elements of each screen will interact and the overall flow of the user experience.

Key Features of a Wireframe:

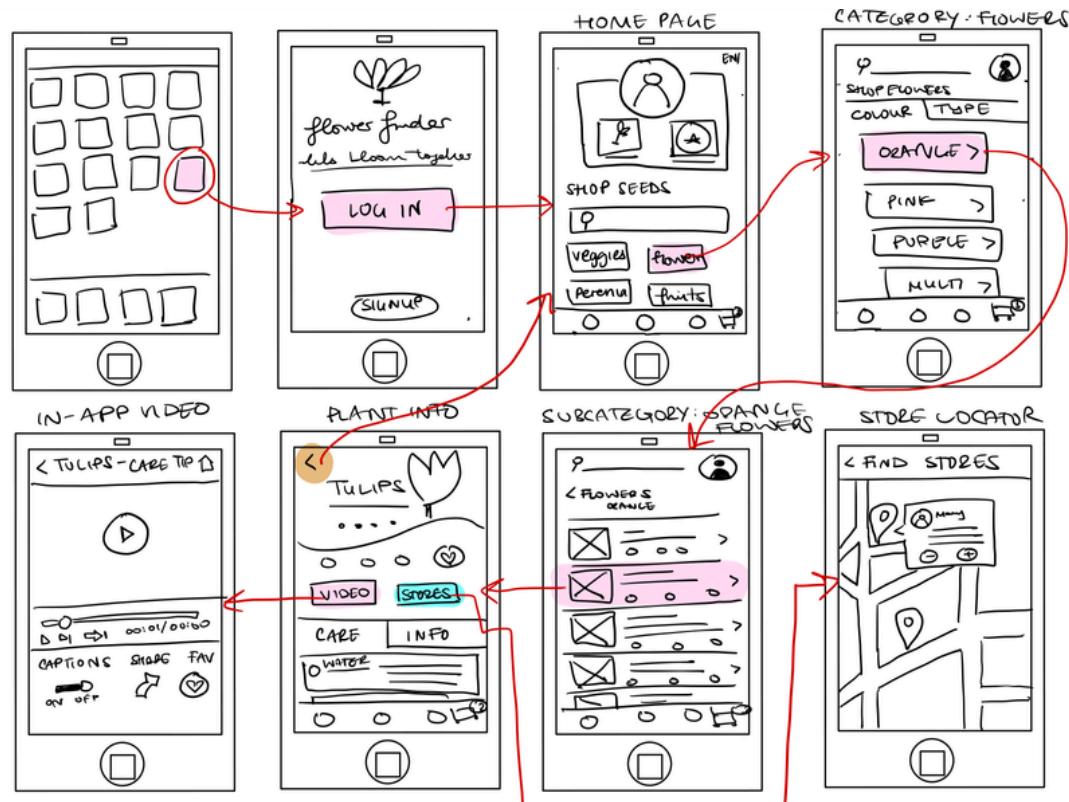
- **Low-Fidelity Design:** Typically uses simple shapes (boxes, lines, circles) to represent elements.
- **Focus on Functionality:** Prioritizes structure, user flow, and placement over aesthetics.

Tools for Wireframing:

- **Digital:** Software like Figma and Adobe.
- **Analog:** Pen and paper or whiteboards for quick sketches.

Benefits of Wireframing:

- Clarifies ideas early in the design process.
- Saves time and resources by identifying potential design issues before development.
- Helps capture a holistic view of the entire user experience.



IMPROVED UX DESIGN

5: RUBRIC



IMPROVED UX DESIGN

/20

“UWAFTSUBMISSION_TASK5.1_GROUP LETTER SCHOOL_2024”

“UWAFTSUBMISSION_TASK5.2_GROUP LETTER SCHOOL_2024”

Category	Excellent (4 pts)	Good (3 pts)	Needs Improvement (2 pts)	Poor (1 pts)
Video Flow and Clarity	Video demonstrates a clear, logical flow of the design; easy to follow and understand.	Video shows the design flow with minor clarity issues.	Design flow is somewhat unclear or difficult to follow.	Design flow is confusing or incomplete.
Explanation of Features and Changes	All features and changes are clearly explained and justified with strong rationale based on user feedback.	Most features and changes are explained; minor details may be missing.	Features and changes are mentioned, but explanations lack clarity or depth.	Features and changes are unclear or missing; no rationale provided.
User-Centered Rationale	Strong rationale for changes clearly addresses user needs and insights from testing.	Rationale addresses user needs but lacks depth.	Rationale for changes is weak or not fully aligned with user feedback.	No rationale for changes or connection to user feedback.
Wireframe Quality	Wireframe clearly visualizes the overall design flow; organized layout; all key screens are included and detailed.	Wireframe covers the design flow well; minor layout or detail issues.	Wireframe includes basic screens but lacks detail or has layout issues.	Wireframe is incomplete, disorganized, or key screens are missing.
Presentation and Submission Quality	Professional, well-organized, and error-free submission; correct file names and formats; clear visuals.	Organized and clear; minor issues with formatting or naming conventions.	Several errors in formatting, naming, or presentation.	Submission is disorganized; incorrect file names or formats; poor presentation.

PITCH PRESENTATION TASK 6:



Objective:

Develop and deliver a compelling, clear, and engaging elevator pitch as well as overall presentation to effectively communicate product value, key elements, MATLAB model, additional features, and user testing results. The presentation should demonstrate creativity, maintain audience engagement, and provide insightful explanations and findings. **The tasks include:**

Task 6.1: 1 Minute Elevator Pitch

Submission name:

"UWAFTSubmission_Task6.1_GROUP LETTER SCHOOL_2024"

Craft a 1 minute Elevator Pitch to capture investors' attention

- Identify the target and core problem your product delivers value to.
- Demonstrate why investors should buy-in to your product.
- Demonstrate key ideas of your product.

Task 6.2: Presentation

(3 minute overview voice-recorded presentation)

"UWAFTSubmission_Task6.2_GROUP LETTER SCHOOL_2024"

1. Develop a Clear MATLAB Model Explanation

- a. Provide a clear, concise, and engaging explanation of your MATLAB model with strong relevance to the product.
- b. Outline the key components and purpose of the MATLAB model.
- c. Use visuals or diagrams to enhance understanding.

2. Explain the Additional Features with Detail and Creativity

- a. Identify and describe the other features of the app, explaining their functionality.
- b. Justify why each feature is included and how it enhances the application.
- c. Develop use cases or examples illustrating how each feature works.
- d. Ensure the explanation shows how the feature integrates smoothly with the overall UX.

3. Present UX Testing Results, Findings, and Improvements

- a. Reflect on the user testing process - summarizing what went well, what didn't, and how you would do things differently next time.
- b. Highlight significant findings with supporting documentation.
- c. Identify improvements based on testing outcomes and feedback.
- d. Ensure results and improvements are presented creatively to maintain engagement.

4. Ensure Overall Creativity and Engagement

TASK 6: RUBRIC PRESENTATION & PITCH



PRESENTATION & PITCH - RUBRIC

/20

“UWAFTSUBMISSION_TASK6.1_GROUP LETTER SCHOOL_2024”

“UWAFTSUBMISSION_TASK6.2_GROUP LETTER SCHOOL_2024”

Category	Excellent (4 pts)	Good (3 pts)	Needs Improvement (2 pts)	Poor (1 pts)
Elevator Pitch, Target Audience, & Core Problem	Clear, concise, and compelling pitch; effectively identifies the target audience and core problem; strong delivery and engagement.	Pitch is clear and engaging; target audience and problem identified with some clarity.	Pitch lacks engagement or has a vague target audience and core problem.	Pitch is unclear, unengaging, or target audience and problem are missing.
MATLAB Model Explanation	Clear, concise explanation of the MATLAB model; visuals enhance understanding; strong relevance to product.	MATLAB model is explained well; visuals used, but explanation could be clearer.	MATLAB model explanation lacks clarity or detail; visuals are limited.	MATLAB model explanation is unclear, incomplete, or irrelevant.
Additional Features and Creativity	Features are described in detail and creatively; clear justification and examples of use cases provided.	Features are explained with some creativity; examples are present but basic.	Features are described, but explanations lack detail or creativity.	Features are unclear or missing; lacks creativity and justification.
User Testing Results and Improvements	Reflects on user testing effectively; highlights significant findings and improvements with creativity.	User testing results presented well; improvements noted but lack depth.	User testing results or improvements are vague or lack supporting evidence.	User testing results are unclear or missing; no improvements identified.
Overall Creativity and Engagement	Presentation is highly creative and engaging; maintains audience interest throughout.	Presentation is creative and engaging, but some sections need improvement.	Presentation shows limited creativity or engagement.	Presentation lacks creativity, engagement, or structure.

OVERALL SCORING

CONVENTIONS

	Task Description	Points
1	Application analysis and Strategy	/20
2	Model Coding and Explanation	/20
3	UX Testing and adjustments	/20
4	4 minute presentation and Pitch	/20
5	1.5 minute presentation of UX Design application	/20
	TOTAL	100

