Project (ENSE 375)

1. **Project Description:** In groups/teams of 3 (choose your own team members), teams will design and develop a software application of their choice by using Java programming language, test-driven development methodology and Junit for test cases (where applicable). Test your application using following techniques. (Remember, the project's main objective is to design the optimal test suits for the application).
    - Choose any function from the application and test it with
        - Path testing
        - Data flow
        - Logic coverage
    - Choose a subset of units to perform Integration testing.
    - Perform the validation of your application by using the following:
        - Boundary value testing
        - Equivalence class testing
        - Decision tables testing
        - State transition testing
        - Use case testing.

    Note: As mentioned, your team's proposed software application must be approved by the instructor and be of adequate scope for an approximate 2-month design/development time-box. Think small-to-medium project scope. Examples could include an employee scheduler application for an organization, an asset management tool for a company to manage and track equipment purchases, an exercise tracker and learning management system, a howitzer firing simulator etc.

    Hint: Follow along with what Lab Instructor has in store for you. The labs will greatly assist you while developing the application and writing the test cases. Best to follow along with the labs and learn!

2. **Design and Architecture:** You need to go through the structured engineering design process (Figure 1) while considering different factors that can impact the final product. Teams can use a software development lifecycle and code management approach of their choice.

3. **Design Constraints:** Your solution should consider if not all but at least four from the following list of design constraints
    a. Economic factors
    b. Regulatory compliance (Security and Access)
    c. Reliability
    d. Sustainability and Environmental Factors
    e. Ethics
    f. Societal Impacts

4. **Teamwork:** Each group must uphold the best teamwork strategy, including team formation, time management, and conflict resolution.

5. **Presentation Requirements:** A separate written report is NOT required, but the entire GitHub project should be 'self-documenting'
    - The project should include a **REPORT.md** file describing the use instructions of your application and providing other details according to the project file template (Project_File_Template.pdf) available on UR courses.

- The project should include a TESTING.md that describes the test plan. It should include any necessary information to understand the test cases. For example, in equivalence class testing it should state what the equivalence classes are and for system testing it should contain the use cases being tested. This should not be a long document but should contain a minimum information about all the technical requirements.
- Your team's GitHub must remain public for the duration of ENSE 375, at a minimum. Remember, your GitHub is your portfolio of work for future employers to understand the type of experiences you have had, so keeping it public for long-term is not a terrible idea.
- All the code should be well commented.

6. **Project Deliverables:** Besides fulfilling the presentation requirements, following will be delivered while following the given schedule
    a. A functional and systematically tested prototype
    b. Technical report (REPORT.md)
    c. Testing report (TESTING.md)

S. No.	Deliverables	REPORT.md Components	Timeline
1.	Problem Definition	Section 2.1 (in project file template)	3rd Week
2.	Design Constraints and Requirements	Section 2.2	4th Week
3.	Iterative Engineering Design Process	Section 3.1 – 3.2	7th Week
4.	Final Design, Implementation and Testing	Section 3.3	11th Week
5.	Collaborative Teamwork and Communication Skills	Section 4 - 5	

- Students are required to fill Teamwork and Project Management sections (Project_File_Template.pdf on UR courses) of the report (REPORT.md) simultaneously with every report component and should be updated regularly.
- After 3rd week, weekly meetings will be held to monitor the progress of the work.

7. **Submission Instructions:**
    - Due: Day before the final exam at mid night – August 01, 2024, 23:59:59
    - Be sure to commit and commit often. I will use GitHub to review your solution.
    - Please email me the GitHub project names and the hashes of the commits you are submitting to make sure we are looking at the same code.
    - Remember, I will mark the project using the rubric available on the UR Courses.

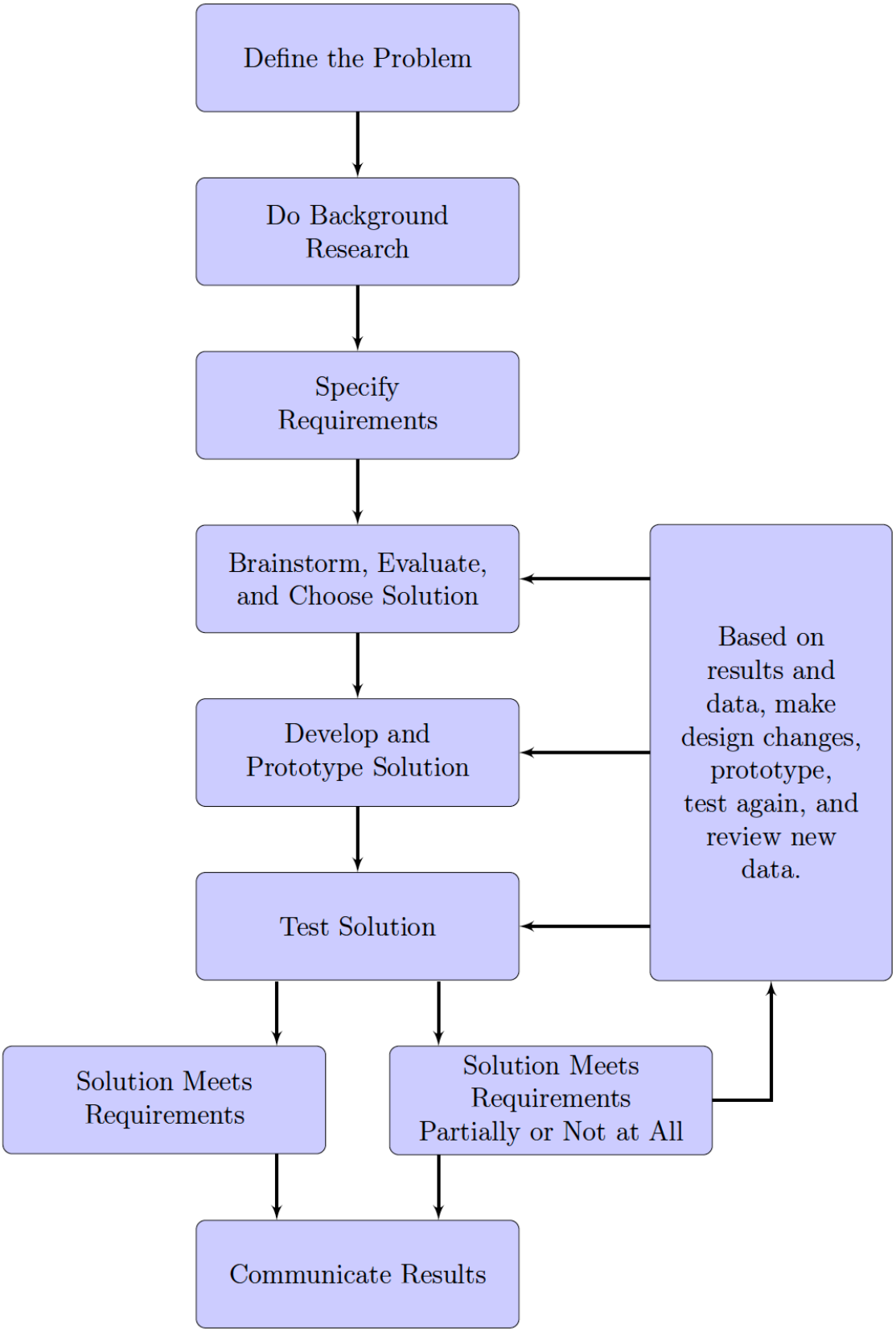

Figure 1: Engineering Design Process