



Empowerment Through Quality Technical Education  
**AJEENKYA DY PATIL SCHOOL OF ENGINEERING**

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# **LAB MANUAL**

## **Computer Lab II- UI/UX Design**

(417526)

## **BE (AI&DS) 2019 COURSE**

**Course Coordinator**

**Mrs. Ankita Harshad Tidake**

**DEPARTMENT OF  
ARTIFICIAL INTELLIGENCE & DATA SCIENCE**

## Department of Artificial Intelligence & Data Science

### **Vision:**

Imparting quality education in the field of Artificial Intelligence and Data Science

### **Mission:**

To include the culture of R and D to meet the future challenges in AI and DS.

To develop technical skills among students for building intelligent systems to solve problems.

To develop entrepreneurship skills in various areas among the students.

To include moral, social and ethical values to make students best citizens of country.

### **Program Educational Outcomes:**

1. To prepare globally competent graduates having strong fundamentals, domain knowledge, updated with modern technology to provide the effective solutions for engineering problems.
2. To prepare the graduates to work as a committed professional with strong professional ethics and values, sense of responsibilities, understanding of legal, safety, health, societal, cultural and environmental issues.
3. To prepare committed and motivated graduates with research attitude, lifelong learning, investigative approach, and multidisciplinary thinking.
4. To prepare the graduates with strong managerial and communication skills to work effectively as individuals as well as in teams.

### **Program Specific Outcomes:**

**Professional Skills-** The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, networking, artificial intelligence and data science for efficient design of computer-based systems of varying complexities.

**Problem-Solving Skills-** The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.

**Successful Career and Entrepreneurship-** The ability to employ modern computer languages, environments and platforms in creating innovative career paths to be an entrepreneur and to have a zest for higher studies.

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### 1. Guidelines to manual usage

This manual assumes that the facilitators are aware of collaborative learning methodologies.

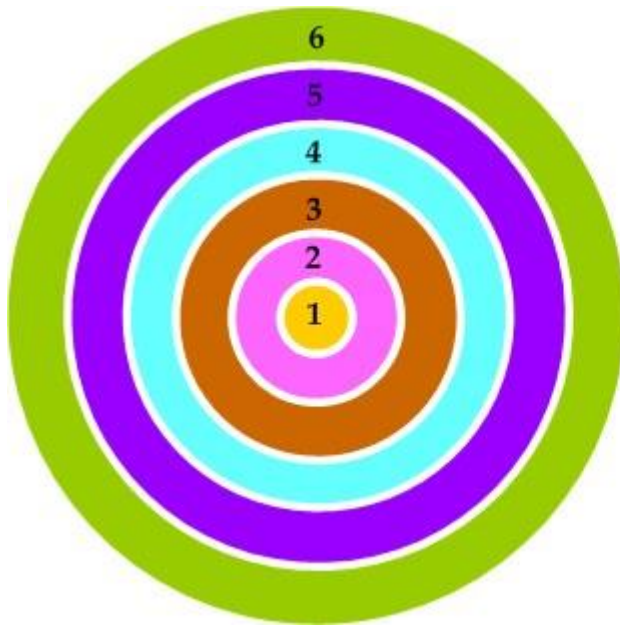
This manual will provide a tool to facilitate the session on Digital Communication modules in collaborative learning environment.

The facilitator is expected to refer this manual before the session.

#### Icon of Graduate Attributes

|                                       |                                |   |  |
|---------------------------------------|--------------------------------|---|--|
| <b>K</b><br>Applying<br>Knowledge     | <b>A</b><br>Problem Analysis   | <b>D</b><br>Design<br>Development           | <b>I</b><br>& Investigation of<br>problems |
| <b>M</b><br>Modern Tool Usage         | <b>E</b><br>Engineer & Society | <b>E</b><br>Environment<br>Sustainability   | <b>T</b><br>Ethics                         |
| <b>T</b><br>Individual & Team<br>work | <b>O</b><br>Communication      | <b>M</b><br>Project Management<br>& Finance | <b>I</b><br>Life-Long Learning             |

Disk Approach- Digital Blooms Taxonomy



- 1: Remembering / Knowledge**
- 2: Comprehension / Understanding**
- 3: Applying**
- 4: Analyzing**
- 5: Evaluating**
- 6: Creating / Design**

### Program Outcomes

1. **Engineering knowledge:** An ability to apply knowledge of mathematics, including discrete mathematics, statistics, science, computer science and engineering fundamentals to model the software application.
2. **Problem analysis:** An ability to design and conduct an experiment as well as interpret data, analyze complex algorithms, to produce meaningful conclusions and recommendations.
3. **Design/development of solutions:** An ability to design and development of software system, component, or process to meet desired needs, within realistic constraints such as economic, environmental, social, political, health & safety, manufacturability, and sustainability.
4. **Conduct investigations of complex problems:** An ability to use research based knowledge including analysis, design and development of algorithms for the solution of complex problems interpretation of data and synthesis of information to provide valid conclusion.
5. **Modern tool usage:** An ability to adapt current technologies and use modern IT tools, to design, formulate, implement and evaluate computer based system, process, by considering the computing needs, limits and constraints.
6. **The engineer and society:** An ability of reasoning about the contextual knowledge of the societal, health, safety, legal and cultural issues, consequent responsibilities relevant to IT practices.
7. **Environment and sustainability:** An ability to understand the impact of engineering solutions in a societal context and demonstrate knowledge of and the need for sustainable development.
8. **Ethics:** An ability to understand and commit to professional ethics and responsibilities and norms of IT practice.
9. **Individual and team work :**An ability to apply managerial skills by working effectively as an individual, as a member of a team, or as a leader of a team in multidisciplinary projects.
10. **Communication:** An ability to communicate effectively technical information in speech, presentation, and in written form
11. **Project management and finance:** An ability to apply the knowledge of Information Technology and management principles and techniques to estimate time and resources needed to complete engineering project.
12. **Life-long learning:** An ability to recognize the need for, and have the ability to engage in independent and life-long learning.

**Course Name:** Computer Laboratory II: UI /UX Design

**Course Code:** (417526 )

**Course Outcomes**

**CO1:** Apply user-centered design methodologies

**CO2:** Create effective user interfaces / user experiences

**CO3:** Develop proficiency in design tools

**CO4:** Design for multiple platforms and devices

**CO5:** Conduct usability testing and analysis

**CO6:** Develop a portfolio of UI/UX design projects

**CO to PO Mapping:**

| PO/CO      | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| <b>CO1</b> |     | 3   | 3   |     | -   | 2   | -   | 2   | -   | -    | -    |      |
| <b>CO2</b> |     |     | 3   |     | 3   | -   | -   | -   | -   | 2    | -    |      |
| <b>CO3</b> | 2   |     |     |     | 3   | -   | -   | -   | -   | -    | -    | 3    |
| <b>CO4</b> |     |     | 3   |     | 3   | -   | -   | -   | -   | -    | -    |      |
| <b>CO5</b> |     | 3   |     | 3   |     |     |     |     | 2   | 2    |      |      |
| <b>CO6</b> |     |     | 3   |     | 3   |     |     |     |     | 3    | 2    |      |

**CO to PSO Mapping:**

|     | PSO1 | PSO2 | PSO3 |
|-----|------|------|------|
| CO1 | 2    | 2    | -    |
| CO2 | 2    | 2    | -    |
| CO3 | 2    | 2    | -    |
| CO4 | 2    | 2    | 1    |

## 2. Laboratory Objective

### 1. Master Prototyping and Wireframing Tools:

Gain proficiency in industry-standard tools like Figma, Adobe XD, or Sketch to create effective wireframes and interactive prototypes for user interfaces.

### 2. Conduct Usability Testing and Analyze Results:

Learn how to plan, execute, and analyze usability tests, using feedback to refine and improve UI/UX designs.

### 3. Design for Multiple Platforms and Devices:

Practice designing responsive and adaptive interfaces that function seamlessly across web, mobile, and desktop platforms.

## Laboratory Equipment/Software

### 3. Software Requirements

**Design and Wireframing Tools-** Figma, Adobe XD, Pencil, Penpot, Inkscape, GIMP

**Prototyping and Interaction Design Tools-** InVision, Axure RP, Marvel App, Penpot

**Usability Testing and Feedback Tools –** UsabilityHub, Lookback, Maze

**Graphics Design and Asset Creation Tool:** Canva, Adobe Photoshop, Adobe Illustrator

**Collaboration and Feedback Tool:** Miro, Slack, Zeplin

**Project Management and Version Control:** Github, Jira

**Browser Developer Tools:** Chrome DevTools, FireFox Developer Tools, Safari / WebKit Inspector

**Typography and Icons (Free/Open Source):** Google Fonts, FontAwesome (Free Version)

### 4. Hardware Requirements

**Processor:** Intel Core i5/i7 or AMD equivalent.

**RAM:** Minimum 8 GB (16 GB or more recommended for handling design tools smoothly).

**Storage:** At least 500 GB SSD (for faster file access and storage).

**Graphics Card:** Dedicated GPU (NVIDIA or AMD) for handling graphic-intensive tasks (optional but recommended).

**Display:** Full HD (1920x1080) or higher resolution monitors for accurate color and design representation.

### Multiple Devices for Testing:

**Mobile Devices** (iOS and Android smartphones and tablets) for testing responsive designs and app prototypes.

**Tablets or Touchscreen Devices** for simulating interactions on touch interfaces.



## 5. Laboratory Experiment list

| Sr. No | Title   |
|--------|---|
|        | <b>List of Assignments</b>  |
|        | <b>Group-A</b>  |
| 1      | Design user persona for the users of selected product / system.<br>II. How To Create A User Persona (Video Guide) - YouTube<br>III. How to Create A User Persona in 2022 [FULL GUIDE] - YouTube   |
| 2      | Online Learning Platform: Design a wireframe for an online learning platform that includes course listings, video lectures, quizzes, and progress tracking.<br>I. E-learning Website Design in Figma - YouTube  |
| 3      | Designing a Social Fitness App: Create wireframes and a prototype for a social fitness app that allows users to track workouts, connect with friends, and share progress. Design the user interface for logging exercises, setting goals, and incorporating social features.<br>I. Fitness App Design In Figma    Figma Tutorial    Design & Prototyping - YouTube  |
| 4      | Use Figma tool to Design a user interface for a recipe finder application, allowing users to search for recipes based on ingredients, categories, and dietary restrictions. Include features like recipe details, cooking instructions, and saving favorites.<br>I. Create a Food & Drink Recipe app with reviews from Figma no code - YouTube  |
| 5      | Use Figma tool for Improving the User Interface of a Fitness Tracking App: Improve the user interface of an existing fitness tracking app by focusing on simplicity, clarity, and motivational elements. Enhance features like tracking workouts, setting goals, and visualizing progress to create a more engaging and intuitive experience.<br>I. Figma Fitness mobile app Design   design a Fitness app in Figma   UIUX Design 2021  Techno-fine - YouTube |
| 6      | Usability Testing Simulation: Develop a high-fidelity interactive prototype using any UI/UX tool.<br>Prepare a usability testing plan, recruit participants, and simulate usability testing sessions. Analyze the feedback and iterate on the design based on the insights gathered during the testing.   |

### 5.1.Experiment No. 1

**Aim:** Design user persona for the users of selected product / system

**Objective:**

Understand the target audience's behaviours, goals, frustrations, and preferences.

Create realistic user personas to guide the development process.

**Theory:**

A user persona is a fictional, generalized representation of a real user. These personas are built from research and data about the target users of a product or service. They represent the diverse needs, motivations, and challenges of the real users, helping the product team design with empathy and focus.

By creating user personas, designers and developers can better understand their audience's behaviors, pain points, and goals, enabling them to make decisions that align more closely with real user needs. Without personas, it's easy to design for "everyone," which can result in a product that meets no one's needs particularly well. A persona allows the team to focus on specific user types, improving the product's usability and relevance.

Importance of Personas in Product Design:

Personas ensure that all aspects of product development—from design to functionality—are centered on the user. This leads to several key benefits:

Humanizing the Audience: Instead of viewing users as abstract data points, personas give them names, backgrounds, and characteristics that make them easier to relate to.

Focus on User Needs: When developers and designers have a clear picture of their users, they are more likely to create features that solve real problems, rather than what they assume users want.

Alignment Across Teams: Personas help align various teams (designers, developers, marketing) by providing a unified view of the user, ensuring that all decisions are made with the user in mind.

Informed Decision-Making: By understanding the user's context, motivations, and frustrations, decisions can be data-driven, focusing on usability and experience rather than guesswork.

Key Components of User Personas:

Name, Age, Demographics: Basic information to give personality to the persona.

Behaviours and Preferences: How the user interacts with similar products.

Goals: What the user hopes to achieve by using the product.

Frustrations: Pain points or challenges they encounter with similar products.

Technology Use: What devices, apps, or platforms they commonly use.

**Applications:**

User personas are widely used in:

Product Design: Ensuring the product meets the needs of its target users.

Marketing: Targeting specific user segments with personalized messaging.

UX/UI Design: Creating user-centered interfaces based on real user behaviors.

**Input:**

Research on user demographics, behavior patterns, and motivations.  
Surveys, interviews, and data analysis of potential users.

**Output:**

At least two complete user personas including:

Name and Picture

Demographic Information

Goals and Motivations

Challenges/Frustrations

User Journey

**Conclusion:**

By creating user personas, the design and development team can better empathize with users, leading to a more user-friendly product that meets specific user needs.

**Outcome:**

Upon completion of this experiment, students will be able to:

**Experiment level outcome:**

(ELO1): Students will be able to conduct user research and gather relevant data about target users.

(ELO2): Students will be able to create detailed and realistic user personas.

(ELO3): Students will understand how personas influence design decisions and enhance user-centered design practices.

**Questions:**

1. What is the primary purpose of creating a user persona?
2. Name three key components of a user persona.
3. How do user frustrations impact product design?
4. What role does technology use play in shaping a user persona?
5. How does a user persona help in improving the usability of a product?
6. What is the importance of defining user goals when designing a product?

## 5.2.Experiment No. 2

**Aim:** Design a wireframe for an online learning platform that includes course listings, video lectures, quizzes, and progress tracking.

**Objective:**

1. To structure a functional and intuitive interface for an online learning platform.
2. Ensure easy navigation for users to access courses, lectures, quizzes, and track their progress

**Theory:**

A **wireframe** is a low-fidelity blueprint of a product's layout, content structure, and functionality. Wireframes serve as the foundation for designing more detailed user interfaces (UI) and help teams visualize how users will interact with different elements of a platform. In the context of an online learning platform, a wireframe outlines the navigation paths, key features, and page hierarchy, ensuring that users can easily find and engage with courses, videos, quizzes, and track their learning progress.

Key Concepts in Wireframing:

**Low-Fidelity vs. High-Fidelity:** Wireframes are typically low-fidelity representations of a product. They do not include detailed design elements such as colors, images, or typography. The focus is solely on structure, content layout, and functionality.

**User Journey:** Wireframes reflect the flow of how users will move through the online learning platform, from signing up to selecting courses, watching videos, completing quizzes, and tracking their progress.

**Usability and Navigation:** Wireframes help ensure that the platform is intuitive, with clear navigation. For example, course listings should be easy to access, and users should quickly locate video lectures, quizzes, and their progress dashboard.

**Content Hierarchy:** Wireframes prioritize information based on its importance to the user. On an e-learning platform, the course catalog, user dashboard, and progress-tracking features are crucial elements that need to be prominently displayed.

**Wireframing Tools:** There are many tools available for creating wireframes, such as Figma, Adobe XD, Sketch, or Balsamiq. These tools allow for quick iteration and adjustment based on feedback from stakeholders.

Role of Wireframes in Product Development:

Wireframes are an essential step in product development because they:

**Serve as a blueprint:** Wireframes guide both the UI/UX design and the development process, ensuring that everyone on the team is aligned on the core structure of the product.

**Help identify usability issues early:** By focusing on layout and user flow, wireframes make it easier to spot potential issues or bottlenecks in the user journey before visual design or coding begins.

**Facilitate collaboration:** Wireframes make it easier to communicate design ideas to stakeholders, developers, and other team members, allowing for feedback and iteration before moving to high-

fidelity design.

In the context of an online learning platform, wireframes help ensure that all essential features—such as course listings, video playback, quizzes, and progress tracking—are properly integrated and easily accessible

**Application:**

- E-learning Websites: EdTech platforms like Coursera, Udemy, etc.
- Corporate Training: Platforms designed for employee upskilling.
- Online Certifications: Websites that track progress and award certificates upon completion

**Input:**

- List of required features (course listings, video playback, quizzes).
- User experience best practices for e-learning platforms.
- Wireframing tool (e.g., Figma, Sketch, Adobe XD)

**Output:**

Wireframe of key pages:

Homepage: Includes search bar, featured courses, and categories.

Course Page: Course outline, video player, quiz access, and tracking.

User Dashboard: Shows enrolled courses, completion percentage, and milestones.

**Conclusion:**

A clear and user-friendly wireframe for an online learning platform helps ensure that users can easily navigate the site, access materials, and track their progress, ultimately enhancing their learning experience.

Outcome:

**Upon completion of this experiment:**

Experiment level outcome (ELO1): Students will gain proficiency in designing wireframes for an online platform.

**Questions:**

1. What are the key features to include in the wireframe for an online learning platform?
2. How should course listings be displayed in the wireframe for easy navigation?
3. Why is it important to incorporate progress tracking in the wireframe design?
4. What is the benefit of including quizzes in the wireframe of an online learning platform?
5. How can a wireframe be optimized for both desktop and mobile use?
6. What is the purpose of creating a wireframe before developing a learning platform?

### 5.3.Experiment No. 3

**Aim:** To design wireframes and an interactive prototype for a social fitness app that allows users to track workouts, connect with friends, and share their progress.

**Objective:**

1. Develop wireframes for core app functionalities like workout logging, social features, and goal setting.
2. Create a functional prototype to demonstrate how the app flows and engages users.

**Theory:**

A social fitness app combines fitness tracking with social features to create a more engaging and motivating experience for users. The app's primary functions include logging workouts, setting fitness goals, tracking progress, and enabling users to connect with friends to share their fitness journey. Wireframing and prototyping are crucial steps in visualizing and refining the app's functionality and user flow.

**Key Concepts in Social Fitness App Design:**

**Fitness Tracking:** The app allows users to log their workouts, track metrics such as distance, calories burned, and time spent on activities. This feature often includes customizable workout routines or templates.

**Goal Setting and Progress Tracking:** Users can set personal fitness goals, such as weight loss, muscle gain, or completing a certain number of workouts. The app should display progress visually, using graphs, milestones, or badges to keep users motivated.

**Social Features:** Social fitness apps often incorporate features like activity feeds, where users can see updates from friends, like or comment on their progress, and participate in group challenges or competitions.

**Notifications and Reminders:** Notifications keep users engaged by reminding them to log workouts, meet goals, or check in with friends. It can also inform users of achievements within their social circle.

**User Experience (UX):** For a fitness app, UX design is crucial. The app needs to be easy to use, with clear navigation paths, simple workout logging options, and motivational feedback. Since users will likely use the app during workouts, the interface should be intuitive and not overly complicated.

**Wireframes and Prototyping:**

**Wireframes:** Provide a structural layout of the app's core screens, such as the workout logging interface, the social feed, the user's profile, and the progress tracking dashboard. Wireframes help visualize the flow and organization of these elements.

**Prototypes:** A prototype is an interactive simulation of the app's user experience. In prototyping, designers link wireframe screens together to simulate the user journey. This allows for testing and refining interactions and transitions before the final design is developed.

**Role of Wireframes and Prototypes in Fitness App Development:**

**Wireframes:** Wireframes focus on the app's structure and functionality, ensuring that users can

smoothly log their workouts, interact with friends, and track their progress. It helps identify the most important elements that need to be featured prominently (e.g., "Add New Workout" button or progress summary).

**Prototyping:** Prototypes are used to test the user flow and interactions before the app is fully developed. Prototypes help teams visualize how users will move from one screen to another, how notifications or social interactions will function, and whether the workout logging and goal-setting features are user-friendly.

**User Testing:** Interactive prototypes allow for early usability testing. By simulating how users will interact with the app, teams can gather feedback, identify pain points, and adjust the design or flow accordingly.

In the case of a social fitness app, wireframes and prototypes allow the design and development team to test and refine how well the app motivates users to stay fit while encouraging social engagement with friends.

### **Applications:**

**Health and Fitness:** Apps like Strava, MyFitnessPal, and Fitbit.

**Social Platforms:** Fitness apps that incorporate social elements to engage users.

**Motivation Tools:** Apps that use social accountability to help users stay committed to their fitness goals.

### **Input:**

Research on popular fitness apps and social features.

Tools like Figma or Adobe XD for wireframing and prototyping.

List of core functionalities (workout tracking, social feed, notifications).

### **Output:**

Wireframes of:

Login/Signup Screen

Dashboard: Overview of user stats and social feed.

Workout Logging Screen: Interface for entering workout details.

Goal Setting Page: Allowing users to set and track fitness goals.

Interactive prototype demonstrating user flow from logging in to logging workouts and sharing progress.

### **Conclusion:**

By combining fitness tracking with social features, the app fosters a sense of community and accountability, helping users achieve their fitness goals in a more engaging way.

### **Outcome:**

Upon completion of this experiment, students will be able to:

**Experiment level outcome (ELO1):** Design functional wireframes for a fitness app, integrating

both workout tracking and social features.

**Questions:**

1. What is the main function of a social fitness app?
2. How does a wireframe help in structuring the features of a social fitness app?
3. What elements are essential for tracking workouts in the app prototype?
4. Why is it important to include social features like connecting with friends in a fitness app?
5. What type of progress tracking features should be included in the wireframe?
6. How does a prototype differ from a wireframe in the design process?



## 5.4.Experiment No. 4

### Aim:

To design a user-friendly interface for a recipe finder application, allowing users to search for recipes based on ingredients, categories, and dietary restrictions, and include features like recipe details, cooking instructions, and saving favorites.

### Objective:

1. Develop an intuitive UI that simplifies the process of searching for recipes.
2. Ensure the app accommodates various filters, including ingredients, categories, and dietary preferences.
3. Provide features for saving favourite recipes and viewing detailed cooking instructions.

### Theory:

The **recipe finder application** aims to assist users in discovering recipes by utilizing ingredients they already have. To create an effective user experience, the design should be intuitive and user-friendly, ensuring seamless navigation and ease of use.

#### 1. Search Bar

- **Purpose:** The search bar is a primary interaction tool that allows users to find recipes by entering ingredient names or specific recipes.
- **UI Design:**
  - Place the search bar prominently at the top of the main screen.
  - Use clear placeholder text like "Search by ingredients or recipe name..." to guide the user.
  - Implement **auto-suggestions** to assist users in finding relevant recipes as they type.
  - Allow for **voice input** for hands-free searching, enhancing accessibility.

#### 2. Filters and Categories

- **Purpose:** Users may want to narrow down results based on personal preferences or dietary needs.
- **UI Design:**
  - Integrate a **filter button** next to the search bar that opens a modal or dropdown menu.
  - Provide filters for:
    - **Cuisine type** (e.g., Italian, Mexican).
    - **Meal types** (e.g., breakfast, lunch, dinner, snacks).
    - **Dietary restrictions** (e.g., vegan, gluten-free, low-carb).
    - **Cooking time** (e.g., under 30 minutes).
  - Use **toggle switches or checkboxes** for ease of selection.
  - Allow for **multiple filters** to be applied at once to give users flexibility.

#### 3. Recipe Details

- **Purpose:** Provide users with comprehensive information about each recipe, so they can

easily follow and prepare it.

- **UI Design:**
  - The layout should include the following clearly labeled sections:
    - **Ingredients list:** Display this in an easy-to-read checklist format so users can tick off ingredients they already have.
    - **Cooking instructions:** Present these step-by-step, possibly with numbered or bulleted points for clarity.
    - **Nutritional information:** Provide data like calorie count, macronutrients, and other relevant values.
    - **Preparation time:** Indicate both preparation and total time.
    - Include **visual aids** like images or short videos showing the finished dish or key cooking steps.
  - Ensure the design accommodates large **font sizes** and **responsive layouts** for mobile users.
  - Include an option to **scale recipe quantities** based on the number of servings needed.

#### 4. Favourites Feature

- **Purpose:** Users may want to save recipes to access later without searching again.
- **UI Design:**
  - A **heart icon** or a clear "Save to Favorites" button should be placed within each recipe page.
  - Users should be able to access their favorites easily, possibly from a dedicated "**Favorites**" section in the navigation menu.
  - Consider including a "**Recently Viewed**" section to help users quickly return to recipes they've browsed.

#### 5. User Interface Principles

- **Simplicity:** Keep the UI clean and clutter-free. Use minimalistic design elements with plenty of white space to ensure clarity and focus on the key features (search, recipes, and filters).
  - Use clear **typography** and **iconography** to guide users without overwhelming them.
  - Limit the number of actions available on a single screen to avoid cognitive overload.
- **Consistency:** Ensure that design patterns are uniform across the application.
  - **Navigation menus**, buttons, and text styling should remain consistent throughout the app.
  - Ensure that interactions like buttons or dropdowns behave the same way across different screens.
- **Clear Navigation:** Users should be able to quickly move through the app without confusion.

- Use a simple **tabbed navigation bar** at the bottom of the screen for easy access to key sections (e.g., Home, Favorites, Profile).
- Provide **breadcrumbs** or a simple back button on recipe details pages to help users navigate back to search results easily.

## 6. Additional Considerations

- **Responsive Design:** The application should work seamlessly on mobile devices, tablets, and desktop browsers.
- **Loading States:** Include skeleton loading screens or subtle animations to indicate when recipes are being loaded, ensuring users understand that the app is working.
- **Accessibility:** Ensure the app meets accessibility standards with support for screen readers, high-contrast modes, and other assistive technologies.

The goal is to make the user feel empowered to find and create meals easily. By designing a **simple**, **consistent**, and **intuitive** interface, users can quickly search for recipes, apply filters, and follow cooking instructions without any confusion. Keeping the user's journey as smooth as possible through clear layout design and navigation will make the app feel more responsive and effective.

### Applications:

Recipe finder apps are commonly used for:

- Home Cooking: Helping users plan meals with ingredients they already have.
- Special Diets: Allowing users to find recipes suited to specific dietary needs.
- Meal Planning: Assisting with organizing meals and shopping lists based on saved recipe

### Input:

- Figma tool for designing the UI.
- User research on cooking habits and dietary preferences.
- List of core features (search, filters, recipe details, saving favorites).

### Output:

A complete recipe finder UI design in Figma, including:

- Homepage: With a search bar and featured recipes.
- Filters/Category Page: Allowing users to select dietary restrictions or categories.
- Recipe Details Page: Detailed view of the selected recipe with cooking instructions.
- Favorites Page: A section for saved recipes.

### Conclusion:

By designing a user-friendly recipe finder app, students will demonstrate the ability to create a clear, engaging, and functional user interface that simplifies meal planning for users.

### Outcome:

Upon completion of this experiment, students will be able to:

Experiment level outcome

(ELO1): Students will gain proficiency in designing intuitive interfaces in Figma.

(ELO2): Students will learn to incorporate user needs and preferences into UI design.

(ELO3): Students will understand the importance of usability and accessibility in app design.

**Questions:**

1. What search functionalities are important for a recipe finder app?
2. How should recipe details be displayed in the user interface?
3. What feature allows users to save their favorite recipes in the app?
4. Why is it essential to include dietary restriction filters in the app design?
5. How can users search for recipes based on ingredients they have?
6. What role does clarity in cooking instructions play in the app's design

### 5.5. Experiment No. 5

**Aim:**

To improve the user interface of an existing fitness tracking app by enhancing simplicity, clarity, and motivational elements, focusing on features like tracking workouts, setting goals, and visualizing progress.

**Objective:**

1. Redesign the fitness tracking app to enhance user experience through better visuals and clearer functionality.
2. Focus on making the app more intuitive and motivational, encouraging users to track their fitness journey effectively.
3. Simplify the navigation and improve visual representation of progress and goals.

**Theory:**

For a fitness tracking app, the focus of UI/UX design is to create a seamless and motivational experience for users, making it easier to track their fitness activities and stay engaged in their fitness journey.

**1. Workout Logging**

- **Purpose:** Provide users with a quick and simple way to log their daily workouts or activities.
- **UI Design:**
  - Use a **one-tap logging** system where users can easily choose from common workouts or activities (e.g., running, cycling, yoga).
  - Allow for **custom workouts** by providing options to manually input activity details like duration, distance, or calories burned.
  - Present a **quick-add button** prominently on the main dashboard, enabling users to log workouts directly from the home screen without needing to navigate to another section.
  - Include **auto-suggestions** for previous workouts or frequently logged activities to reduce input time.
  - Integrate voice commands or syncing with wearables (e.g., smartwatches) for even faster logging.

**2. Goal Setting**

- **Purpose:** Help users define and pursue fitness goals while keeping track of progress in an easy, motivating way.
- **UI Design:**
  - Create a dedicated **Goal Setting** section where users can set personalized goals (e.g., daily step count, weight loss, workout frequency).
  - Offer **preset goals** to make it easier for users to get started (e.g., a beginner might select "Walk 10,000 steps daily").

- Use sliders or numeric inputs to adjust goals, such as calorie burn or distance.
- Integrate **visual progress bars** or completion rings that update in real-time as the user progresses towards their goals.
- Provide an option for users to **receive daily or weekly progress summaries** via notifications or within the app, motivating them to stay on track.
- Include options for setting **short-term** (e.g., daily or weekly) and **long-term goals** (e.g., weight loss over a few months).

### 3. Progress Visualization

- **Purpose:** Represent users' fitness progress in a way that keeps them motivated and encourages continued activity.
- **UI Design:**
  - Utilize **charts and graphs** to show daily, weekly, or monthly progress for various metrics such as calories burned, steps taken, or workout durations.
  - Make use of **badges and achievements** to visually reward users for reaching milestones (e.g., completing a 5K run or hitting 7 days of continuous activity).
  - Incorporate a **streak feature** to highlight consecutive days or weeks of activity, pushing users to maintain consistency.
  - Display **goal completion percentages** alongside the remaining targets in a clear, engaging way.
  - Make charts interactive, allowing users to tap on specific dates or data points to get detailed information about their workouts.
  - For advanced users, offer more granular data (e.g., pace, heart rate, or elevation) through customizable graph views.

### 4. Simplified Navigation

- **Purpose:** Reduce friction in the user experience by organizing key actions within easy reach and creating an intuitive flow.
- **UI Design:**
  - Implement a **tabbed navigation bar** at the bottom of the screen for quick access to essential sections like "Log Workout," "View Progress," "Goals," and "Profile."
  - Ensure **important actions are within a few taps** from the home screen, such as logging a workout, viewing progress, or adjusting goals.
  - Use a **floating action button (FAB)** for immediate workout logging, providing a fast and straightforward way for users to log activities.
  - Use **clear labels and icons** to reduce ambiguity and help users understand the app's layout intuitively.
  - Make navigation between **different views** (such as workout history, goal setting, and progress charts) smooth by incorporating gestures like swipes for switching tabs.
  - Ensure the **dashboard/home screen** provides an overview of the most relevant information, such as today's goal progress, recent workouts, and upcoming goals,

without overwhelming the user.

### 5. Engagement and Motivation

- **Purpose:** Keep users engaged through motivational triggers, rewards, and reminders to encourage them to meet their fitness goals.
- **UI Design:**
  - **Achievements:** Award users with virtual badges or medals for reaching key fitness milestones, such as "First 10K Steps" or "Workout Streak: 7 Days."
  - **Streaks:** Highlight consistent behavior by showing streaks (e.g., consecutive days of hitting a step goal), motivating users to keep the streak alive.
  - **Progress Reminders:** Incorporate customizable reminders (push notifications) to remind users to log a workout or hit their goals for the day.
  - **Celebratory Animations:** Use simple, fun animations when users hit a goal or log a new personal best, creating a sense of accomplishment.
  - **Social Sharing:** Allow users to share their achievements and progress on social media, fostering a community-driven atmosphere and providing additional external motivation.
  - Offer **personalized feedback** based on user activity, such as "You burned 20% more calories this week compared to last week!" to encourage continued effort.
  - Introduce **challenges** where users can participate in fitness goals (e.g., "Run 50 miles this month") either alone or in groups with friends, adding a competitive, fun element.

### 6. Additional Considerations

- **Personalization:** Allow users to personalize their dashboard, deciding which stats are most important to them (e.g., steps, calories, or active minutes).
- **Responsive Design:** Ensure the app is mobile-friendly, and adjust layouts for different screen sizes, particularly for users on smartwatches and fitness trackers.
- **Accessibility:** Make the app accessible by including features like voice support, large text options, and color-blind-friendly design elements.
- **Offline Mode:** Enable users to log workouts even when they are offline, syncing the data when connectivity is restored.

### Overall User Experience (UX)

The fitness tracking app should create a user experience that is not only simple but also inspiring. Through easy workout logging, motivational progress visualization, and clear goal setting, users will feel supported and driven to reach their fitness objectives. Incorporating gamification elements like badges and streaks, along with personalized feedback, will keep the user engaged and foster a sense of accomplishment.

### Applications:

**Fitness and Health:** Used by individuals to track their workouts, diet, and overall fitness goals.

**Coaching:** Allows fitness coaches to monitor client progress.

**Habit Formation:** Assists users in forming healthier habits by tracking progress and setting

achievable goals.

**Input:**

An existing fitness tracking app to improve.

Figma tool to redesign the user interface.

Research on user preferences, motivational elements, and best practices in fitness app UI design.

**Output:**

Redesigned user interface for a fitness tracking app, including:

**Home Screen:** Showing daily goals and progress updates.

**Workout Logging Screen:** Easy form for users to log activities.

**Goal-Setting Interface:** Simple interface for users to set fitness goals.

**Progress Tracking:** Clear and engaging visuals (graphs, streaks, badges) to show user achievements.

**Conclusion:**

By redesigning the UI of a fitness tracking app, students will enhance the app's usability and effectiveness, creating a more engaging, intuitive, and motivating experience for users.

**Outcome:**

Upon completion of this experiment, students will be able to:

Experiment level outcome (ELO1): understand how to design engaging and intuitive fitness tracking interfaces.

**Questions:**

1. What are the main areas to focus on when improving a fitness app's UI?
2. How does simplicity in UI design improve user engagement in a fitness app?
3. What motivational elements can be added to the app to keep users engaged?
4. How can work-out tracking be visually represented in a clearer way?
5. Why is it important to focus on goal-setting features in a fitness tracking app?
6. How does user feedback help in improving the app's interface?



## 5.6.Experiment No. 6

### Aim:

To develop a high-fidelity interactive prototype using a UI/UX tool (e.g., Figma) and simulate a usability testing session to gather feedback and iterate on the design based on user insights.

### Objective:

Create a high-fidelity prototype that mimics the functionality of the final product.

Conduct usability testing with real users or simulated participants to identify issues in the design.

Use feedback to refine and improve the prototype.

### Theory:

Usability testing is a critical step in ensuring that a product's design is user-centered, functional, and intuitive. By evaluating how real users interact with a product, designers can gain valuable insights into what works and what doesn't, ultimately leading to a more refined and user-friendly experience.

#### 1. High-Fidelity Prototypes

- **Purpose:** High-fidelity prototypes provide users with a near-realistic experience, closely mimicking the final product's look and feel. They allow for accurate testing of the interface's visual design, interactivity, and workflow.
- **Characteristics:**
  - **Detailed visuals:** The prototype includes typography, colors, icons, and images that closely resemble the final product's design.
  - **Interactive elements:** Users can interact with buttons, menus, forms, and navigation elements just as they would in the actual product.
  - **Simulated workflows:** Common user flows, like logging in, navigating through pages, or completing tasks, are fully functional, allowing for a more meaningful usability test.
- **Impact on Usability Testing:** Because the prototype is highly detailed, usability tests can capture more accurate feedback on the design's aesthetics, functionality, and overall user experience.

#### 2. Usability Testing

- **Purpose:** The primary goal of usability testing is to evaluate how easily users can complete tasks using the product and identify any pain points or usability issues.
- **Key Metrics:**
  - **Task Completion Rate:** This measures the percentage of tasks users can complete successfully. A high completion rate indicates that the interface is intuitive and functional.
  - **Time on Task:** This metric tracks how long it takes users to complete tasks. If users take too long or struggle with certain tasks, it can signal that the design is unclear or inefficient.

- **User Satisfaction:** Gathering subjective feedback through post-task surveys or interviews helps gauge how satisfied users are with their experience. This includes ease of use, aesthetics, and overall comfort.
- **Testing Process:**
  - **Observation:** Observers watch users interact with the prototype, noting any difficulties or confusion. This helps identify usability problems that might not be evident through metrics alone.
  - **Think-Aloud Protocol:** Users are encouraged to verbalize their thoughts as they navigate through the product, providing insight into their thought process and revealing any challenges in understanding the interface.

### 3. Testing Plan

- **Purpose:** A structured plan is essential to ensure that the usability test is organized, focused, and effective. It outlines the test's objectives, participant selection, tasks, and methods for collecting feedback.
- **Components:**
  - **Test Objectives:** Clearly define the purpose of the test. For example, "Evaluate the ease of navigation through the main menu" or "Test the efficiency of the sign-up process."
  - **Participant Selection:** Choose participants who represent the target user demographic. This can include age, technical proficiency, or specific needs (e.g., accessibility users).
  - **Tasks:** Create realistic scenarios that participants need to complete, such as "Log in and find a recipe" for a recipe finder app. Tasks should cover core functionalities of the product.
  - **Feedback Collection:** Determine how feedback will be gathered. This can include direct observation, think-aloud sessions, post-test surveys, or interviews. Video recordings can also be used to review user behavior.
- **Importance:** A well-defined testing plan ensures that the test yields valuable and actionable insights, rather than anecdotal or surface-level observations.

### 4. Iterative Design

- **Purpose:** After usability testing, designers refine the prototype based on user feedback, making improvements to navigation, layout, functionality, and overall user experience.
- **Process:**
  - **Analyzing Feedback:** Compile the feedback gathered during testing, identifying common issues or patterns. For example, if multiple users struggle to locate a specific feature, it may indicate a navigation issue.
  - **Prioritizing Changes:** Not all feedback will be equally important. Prioritize changes that have the biggest impact on usability, such as fixing broken workflows or addressing major points of confusion.
  - **Refining the Design:** Make changes to the prototype based on insights gained from

testing. This could involve simplifying navigation, improving visual clarity, or adding more intuitive interactions.

- **Retesting:** Conduct additional rounds of usability testing after each iteration to ensure the changes have improved the user experience and that no new issues have been introduced.
- **Impact:** The iterative design process ensures that the product continuously evolves and improves based on real user input. Each round of testing and refinement helps to create a more polished, user-friendly product.

## 5. Additional Considerations

- **Remote vs. In-Person Testing:** Depending on the nature of the product and target users, usability testing can be conducted in-person (allowing for direct observation and interaction) or remotely (reaching users in different locations).
- **Usability Testing Tools:** Tools like UsabilityHub, Lookback, or Maze can help facilitate remote usability testing, offering screen recordings, task analysis, and user feedback features.
- **Bias Minimization:** Avoid leading questions or prompting users too much during testing. The goal is to observe how naturally users interact with the product, not to guide them toward the “right” actions.

## Overall Impact of Usability Testing

Usability testing plays a pivotal role in uncovering issues that may not be apparent during the design phase. By observing real users and collecting valuable feedback, designers can make informed decisions to improve the product’s user experience. High-fidelity prototypes offer a near-realistic platform for testing, while structured usability testing plans ensure consistency and focus. The iterative design process fueled by user feedback leads to a more intuitive, user-friendly, and polished product in the end.

## Applications:

**Web and App Design:** Usability testing helps improve the overall user experience of apps and websites.

**Product Development:** Testing prototypes ensures that the final product is user-friendly and meets business objectives.

**UX Research:** Provides insights into user behaviors, preferences, and pain points.

## Input:

A high-fidelity interactive prototype developed using Figma or another UI/UX tool.

Usability testing plan with defined tasks and success criteria.

Participants for testing (either simulated or real).

## Output:

**High-fidelity prototype** of the product that can be interacted with, allowing users to perform tasks.

**Usability Testing Report:** Analysis of testing sessions, including user feedback and task

performance data.

**Iterated Prototype:** An improved version of the prototype based on insights from the usability test.

**Conclusion:**

Usability testing is crucial for uncovering design flaws and improving the overall user experience. Through this exercise, students will understand the importance of user-centered testing and iterative design in the product development process.

**Outcome:**

Upon completion of this experiment, students will be able to:

Experiment level outcome:

(ELO1): Students will learn how to design high-fidelity interactive prototypes using Figma or similar tools.

(ELO2): Students will gain practical experience in conducting usability testing sessions.

(ELO3): Students will develop the ability to iterate on designs based on real user feedback.

**Questions:**

1. What is the main purpose of usability testing?
2. How do you recruit participants for usability testing?
3. What tasks should users perform during usability testing?
4. What metrics are used to evaluate the success of a usability test?
5. How is feedback from usability testing used to improve the design?
6. Why is it important to test a prototype before full development?