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Subject	Human Computer Interaction & CG

Lab Number#13

Title: Color in Computer Graphics and HCI

1. Objective

The objective of this lab was to understand the application of **color theory**, **color models**, and **psychological impacts of color** in the design and evaluation of user interfaces in both computer graphics and human-computer interaction contexts.

2. Learning Outcomes

By the end of the lab, students were able to:

- Differentiate between **RGB** and **CMYK** color models.
- Apply **color theory** to interface design.
- Analyze the **psychological and emotional impacts** of different colors on users.
- Evaluate **accessibility** in interface design (e.g., contrast, color blindness).
- Apply **Gestalt principles** in color grouping and perception.

3. Theoretical Concepts

3.1 Color Models

Model	Type	Used For	Description
RGB	Additive	Screens, UI	Combines Red, Green, Blue light
CMYK	Subtractive	Printing	Uses Cyan, Magenta, Yellow, Black

3.2 Psychological Impact of Colors

Color	Emotion Triggered	HCI Application Example
Red	Alert, Danger, Passion	Error messages, warnings
Blue	Trust, Calmness	Login screens, banking apps
Green	Growth, Nature, Positivity	Success messages, eco-apps

3.3 Accessibility Considerations

Challenge	Description	Tool/Solution
Color Blindness	Difficulty distinguishing certain colors	Use high contrast, patterns
Low Contrast	Hard to read interface elements	Follow WCAG guidelines
Cultural Perception	Colors interpreted differently across cultures	Use user-focused testing

4. Hands-on Activity Summary

Activity: Designing a Mobile App Login Screen

- Selected a blue shade in RGB: R = 0, G = 122, B = 255.

- Analyzed its calm and trustworthy effect on users.
- Iteratively changed colors based on peer feedback and emotional response.

HCI Color Theory Login X

← → ↻ http://127.0.0.1:3000/endpoint_unsaved/Untitled-1?username=jne42&password=rf13

Welcome Back

Username

Password

Login

Designed with color accessibility in mind.

5. Gestalt and Color Grouping

- Applied **Gestalt principles** such as *similarity* and *proximity* using color grouping.
- Highlighted important UI elements like CTA buttons with contrasting, noticeable colors.

6. Accessibility Evaluation

- Used tools such as **ColorZilla**, **Adobe Color**, and **WCAG Contrast Checker**.
- Ensured a minimum contrast ratio of **4.5:1** for readability.
- Designed color palettes that support **colorblind users** by avoiding red-green combinations.

7. Reflection

- **Emotional Response:** Learned how colors like red can invoke urgency, while blue creates trust.
- **Design Inclusiveness:** Understood that inclusive design involves considering users with different abilities.
- **Cultural Diversity:** Recognized that color meanings vary (e.g., white = purity in the West, mourning in some Asian cultures).

8. Summary Table

Component	Insights Gained
Color Models	RGB for screens, CMYK for print
Psychological Impact	Emotional and functional use of color

Accessibility	Importance of color contrast and color-blind safety
Gestalt Principles	Grouping and attention guidance using color
Real-world Application	App login screen color testing and user response

9. Additional Resources Consulted

- [Adobe Color](#)
- [Coolors](#)
- [WCAG Guidelines](#)
- [Paletton](#)
- [ColorZilla Chrome Extension](#)

10. Quiz/Knowledge Check (Sample)

Question	Answer
What model is used for screen colors?	RGB
What emotion is linked with the color blue?	Calmness, Trust
What guideline ensures color accessibility?	WCAG (Web Content Accessibility Guidelines)

11. Conclusion

This lab emphasized the crucial role of color in UI/UX design and its deep-rooted psychological and functional implications. By exploring both theory and practical design exercises, I developed a stronger understanding of

how thoughtful color use can enhance usability, accessibility, and emotional connection in digital products.