[22MEPS15] Industrial Design & Rapid Prototyping Techniques

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Objectives:

- Learn to design a UI/UX design and develop an android application.
- Provide working CAD model for prototype development.
- Knowledge in hardware, 3D printers and laser cutters.
- Acquire basic knowledge in designing electrical circuits and fabrication of electronic devices.

UNIT I UI/UX **9**

Fundamental concepts in UI & UX - Tools - Fundamentals of design principles - Psychology and Human Factors for User Interface Design - Layout and composition for Web, Mobile and Devices - Typography - Information architecture - Colour theory - Design process flow, wireframes, best practices in the industry -User engagement ethics - Design alternatives

UNIT II App Development **9**

SDLC - Introduction to App Development - Types of Apps - web Development - understanding Stack - Frontend - backend - Working with Databases - Introduction to API - Introduction to Cloud services - Cloud environment Setup- Reading and writing data to cloud - Embedding ML models to Apps - Deploying application.

UNIT III Industrial Design **9**

Introduction to Industrial Design - Points, lines, and planes - Sketching and concept generation - Sketch to CAD - Introduction to CAD tools - Types of 3D modeling - Basic 3D Modeling Tools - Part creation - Assembly - Product design and rendering basics - Dimensioning & Tolerancing

UNIT IV Mechanical Rapid Prototyping **9**

Need for prototyping - Domains in prototyping - Difference between actual manufacturing and prototyping - Rapid prototyping methods - Tools used in different domains - **Mechanical Prototyping:** 3D Printing and classification - Laser Cutting and engraving - RD Works - Additive manufacturing

UNIT V Electrical Rapid Prototyping **9**

Electronic Prototyping: Basics of electronic circuit design - lumped circuits - Electronic Prototyping - Working with simulation tool - simple PCB design with EDA

TOTAL: 45 PERIODS

Course Outcomes
At the end of the course, learners will be able to:

- Create quick UI/UX prototypes for customer needs
- Develop web application to test product traction / product feature
- Develop 3D models for prototyping various product ideas
- Built prototypes using Tools and Techniques in a quick iterative methodology

Text Books

1. Peter Fiell, Charlotte Fiell, Industrial Design A-Z, TASCHEN America Llc(2003)
2. Samar Malik, Autodesk Fusion 360 - The Master Guide.
3. Steve Krug, Don't Make Me Think, Revisited: A Common Sense Approach to Web Usability, Pearson,3rd edition(2014)

References

1. https://www.adobe.com/products/xd/learn/get-started.html
2. https://developer.android.com/guide
3. https://help.autodesk.com/view/fusion360/ENU/courses/
4. https://help.prusa3d.com/en/category/prusaslicer_204