

Kalinga University Atal Nagar (C.G.)



SCHEME OF EXAMINATION & SYLLABUS

of

**Bachelor of Design – User Experience
(B. Des – UX)**

UNDER

**FACULTY OF ENGINEERING
w.e.f. Session 2021-22**

Bachelor of Design in User Experience

Learning Outcomes

- a. Building new aged professionals who can design for the future users and have acumen of designing digital process for future businesses
- b. Create people with expertise who will eventually emerge as leaders to influence future of UX design
- c. Produce professionals with good analytical, thinking and innovative abilities, skilled with specific techniques, creative in their solutions and knowledgeable about latest development in the field of user experience
- d. The student after undergoing this course will be able to do user research, persona mapping, customer journey mapping, creating Wireframing and prototyping, user interface designing, empathy map, user research methodologies, questionnaire building, task flow, as is and to be task flow, card sorting, building information architecture, visual design for different form factors, usability testing techniques. Students will be able to implement Digital Design Process and can become part of Digital Transformation Space in the Industries of tomorrow.
- e. The student will learn design process, way of thinking, strategic thinking in design field and design thinking
- f. Acquire practical expertise in the field of problem solving leading to innovation
- g. Become proficient in empathizing with users and analyzing their needs
- h. Enable Students to go for higher studies in the area of digital design / Interaction design specialization.

R A I P U R

**B.Des UX Design- 4-year programme
Scheme**

Semester-I						
Paper/ Code	Theory/ Practical	Credit	Hours	External Marks	External Marks	Total
BDESUX101	Sketching & drawing Object sketching, perspective, live sketching, light and shadow	3	45	30	70	100
BDESUX102	Fundamentals of design Fundamentals of 2D Design, elements features and principles	5	75	30	70	100
BDESUX103	Introduction to UX Design Evolution of UX and Misconceptions around it, UX in Everyday life and Trends, Need of UX in Industry	3	45	30	70	100
BDESUX104	History of art & Evolution of design History of design and its relationship with art craft and technology	5	75	30	70	100
BDESUX105	Introduction to Visual Design Visual Principles, Elements and Typography	3	45	30	70	100
BDESUX106	Design Communication and visualizing ideas Critical Thinking, Design Communication	3	45	30	70	100
BDESUX107	Empathy and understanding problems Basics of Human Behaviour and its impact on design, Identifying problems and finding needs	3	45	30	70	100
Total		25	375	210	490	700

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Semester-II						
Paper/ Code	Theory/ Practical	Credit	Hours	External Marks	External Marks	Total
BDESUX201	Sketching & drawing Advance Imagination, Representation, Expression, Exploration, Concept Drawings	3	45	30	70	100
BDESUX202	Visual Design Tools – Photoshop, Illustrator	3	45	30	70	100
BDESUX203	Technology in experience design Innovation and design, AI, AR, VR, IOT	5	75	30	70	100
BDESUX204	UX Design Advance Evolution of UX Design, Introduction to UX industry & job roles, 6D UX design process, Trends in UX	3	45	30	70	100
BDESUX205	Basics of UI Development Evolution of UI Design, Trends in UI, Visual Design	5	75	30	70	100
BDESUX206	Integrated studio for UX Design Project	5	75	30	70	100
BDESUX207	Communication Skill	3	45	30	70	100
Total		27	405	210	490	700



Semester-III						
Paper/ Code	Theory/ Practical	Credit	Hours	External Marks	External Marks	Total
BDESUX301	Ethnography & people design Introduction to Ethnography, Methods, Semiotics, Ethnography study on Globalization	5	75	30	70	100
BDESUX302	Introduction to user research Types of Research, Research Methodologies	3	45	30	70	100
BDESUX303	Service design & task flows Introduction to Service Design, Case Studies, Task Flows Techniques,	3	45	30	70	100
BDESUX304	Information Architecture Task Flow, Understanding Information Architecture, Patterns, Guidelines and Deliverables	5	75	30	70	100
BDESUX305	Introduction to UI Design UI Design Principles, Heuristic Evaluation, Design Tools, Usability Testing	3	45	30	70	100
BDESUX306	Design Thinking Methods and practices, Brainstorming, Mapping, Research	3	45	30	70	100
BDESUX307	Information & Data Study Analysing Data, Visual Representation of Data	3	45	30	70	100
Total		25	375	210	490	700

R A I P U R

Semester-IV						
Paper/ Code	Theory/ Practical	Credit	Hours	External Marks	External Marks	Total
BDESUX401	User research application User Analytics, Invision, Miro, User Testing	3	45	30	70	100
BDESUX402	Service design & task flows advance Service Design Methodologies, Sketch, Figma, Invision, Adobe XD	3	45	30	70	100
BDESUX403	Introduction to Interaction Design Evolution of Interaction Design, current trends and innovation	5	75	30	70	100
BDESUX404	UI Design Advance Sketch, Figma, Invision, Adobe XD	3	45	30	70	100
BDESUX405	Design Thinking Application Invision, Figma, Miro, Coogle	3	45	30	70	100
BDESUX406	Data Analytics Data in UX, Service Design, Decision for Leadership, Gamification and Engagement	3	45	30	70	100
BDESUX407	Introduction to 6D ImaginXPs 6D Design thinking process	5	75	30	70	100
Total		25	375	210	490	700



Semester-V						
Paper/ Code	Theory/ Practical	Credit	Hours	External Marks	External Marks	Total
BDESUX501	Wire framing & Prototyping <i>Figma, Invision, Adobe XD, Balsamiq, Axure</i>	3	45	30	70	100
BDESUX502	Usability Testing <i>User Analytics, Invision, Miro, Hotjar, Zeplin</i>	5	75	30	70	100
BDESUX503	UX & Digitalization <i>UX and digitalization in different industry segments</i>	5	75	30	70	100
BDESUX504	Innovation Management <i>Coming up with ideas, developing, prioritizing and implementing them, as well as putting them into practice.</i>	3	45	30	70	100
BDESUX505	Visual Design Tools Advance <i>Photoshop, Illustrator</i>	5	75	30	70	100
BDESUX506	Technology in Experience Design Advance <i>Technology for digital experience, Technological feasibility and viability, Futuristic Technologies, Futuristic Technologies Continued,</i>	3	45	30	70	100
BDESUX507	Omni channel Experience Design <i>To become omni channel is a necessary practice today. Understanding the growth of multichannel and digital UX is the most significant trend affecting all industries.</i>	3	45	30	70	100
Total		27	375	210	490	700

R A I P U R

Semester-VI						
Paper/ Code	Theory/ Practical	Credit	Hours	External Marks	External Marks	Total
BDESUX601	Interaction Design Advance – <i>Sketch, Figma, Invision, Adobe XD</i>	5	75	30	70	100
BDESUX602	UX Design for futuristic technologies <i>Emerging Technologies, Tools of UX design for emerging technology, Human Machine Relationship</i>	3	45	30	70	100
BDESUX603	UX Design for Rural India <i>Applying the principles of UX design in rural and semi- rural livelihoods and enterprises</i>	3	45	30	70	100
BDESUX604	UI Development – Advance <i>Advance UI Interface design, UI Design Guidelines and Tools, UI design documentation,</i>	5	75	30	70	100
BDESUX605	Industry specific UX design <i>Understand how UX design applies in various industries like Fintech, Digital Healthcare, education etc.</i>	3	45	30	70	100
BDESUX606	Integrated studio for UX - Advance	5	75	30	70	100
BDESUX607	Environmental Science	3	45	30	70	100
Total		27	405	210	490	700



Semester-VII						
Paper/ Code	Theory/ Practical	Credit	Hours	External Marks	External Marks	Total
BDESUX701	Gamification & UX <i>Introduction to Gamification, Gamification in UX its challenges and implementation</i>	3	45	30	70	100
BDESUX702	HMI <i>Evolution of Human Computer Interface, User Interface Models, Graphical User Interface</i>	5	75	30	70	100
BDESUX703	Product design & lifecycle management <i>Introduction to Product Lifecycle Management, importance and benefits, Methods and techniques</i>	5	75	30	70	100
BDESUX704	Business, UX & Design management <i>UX approach in Business, UX Strategy, Design Management</i>	5	75	30	70	100
BDESUX705	Live Project	5	75	30	70	100
Total		23	345	150	350	500

Semester-VIII						
Paper/ Code	Theory/ Practical	Credit	Hours	External Marks	External Marks	Total
BDESUX801	Degree Project Project Reviews Jury	27	405	100	200	300
Total		27	405	100	200	300

R A I P U R

Detailed Syllabus

Year 1 Semester1

Subject Name: Sketching and Drawing
Code: (BDESUX101) | Credits: 3 | Hours: 45

Learning Outcomes:

- To become familiar with the basic methods, techniques & tools of sketching and drawing
- To take part in a community of artists
- To enjoy the challenging and nuanced process of sketching and drawing
- Developing a working concept of what it means to draw.
- Reinforcing the principles of traditional drawing skills.
- Developing new ways of thinking, seeing, and creating.
- Building confidence through exercises that help you explore different types of mark making.

Unit 1: Basics of Sketching and Drawing 9 Hours

History of sketching & drawing, Sketching & its types, Drawing & its types, Difference between sketching and drawing, Common drawing media, Basics of drawing - Line, points, squares, circles, triangles, 2d sketching & drawing

Unit 2: Shapes and forms 9 Hours

Creating layout, shape, line & shadows, shine, Overlap, Texture detail, 3D sketching & drawing. Perspective using forms, cuboid, prisms, cones, sphere.

Unit 3: Still and real life sketching 9 Hours

Application learning with still life, real life sketching.

Unit 4: Drawing Techniques 9 Hours

Blind contour drawing, Negative space drawing, One point perspective, Two-point perspective, Three-point perspective linear perspective, planar analysis and line variations, contours, freehand perspective, line into value., Gesture Drawing, Drawing from a photo, Double image drawing

Unit 5: Drawing human figure 9 Hours

Human Anatomy- Proportion drawing using shapes and drawing human figure composition. John Muir Laws

Reference Books:

- Keys to drawing - Bert Dodson
- Sketching the basics - Koos Eissen and Roselien Steur
- Artist's Drawing Techniques - Dorling Kindersley

Subject Name: Fundamentals of Design
Code: (BDESUX102) | Credits: 5 | Hours: 75

Learning Outcomes:

- Be able to understand elements and principles of design
- Able to grasp stage model of action cycle
- Be able to understand design laws and their importance in design field
- To comprehend various rules of composition of design
- To gain hands-on experience of fundamentals of design

Unit 1: Elements of Design

3 Hours

Introduction to design, Colour and its attributes, line, shape including categories texture, space, form.

Unit 2: Design Action Model and Principles of Design

9 Hours

7 Stage model of action cycle for design tools, Unity, harmony and methods, balance and its types, hierarchy, Scale/proportion, dominance/emphasis, rhythm, similarity and contrast

Unit 3: Laws of Design

9 Hours

Gestalt's principle – 1, Hick's law, The Pareto principle - 80/20 rule, The rule of thirds, Proximity, Feedback, Fitts' law, The golden ratio, Occam's razor, Fibonacci sequence, Mental models, emotional design, Composition of Design

Unit 4: Designing for people

9 Hours

Understanding people's psychology and Behaviour, Famous Case studies on people centric, design, Things to remember when designing for people

Unit 5: Project Work

45 Hours

Project work on fundamentals of design

Reference Books: -

1. Universal principles of Design - William Lidwell, Kritina Holden, Jill Butler
2. Design of Everyday life – Don Norman
3. Universal methods of design – Brus hanignton
4. Hundred things every designer needs to know about people – Susan Weins Chenk

Subject Name: Introduction to UX Design
Code: (BDESUX103) | Credits: 3 | Hours: 45

Learning Outcomes:

- To understand the concept of UX design and how it has evolved
- Able to understand UX design process and methodology
- Able to understand how UX industry work
- To know the job, roles and responsibilities in UX industry
- To understand the importance of UX in digitalization and different types of industries

Unit 1: Evolution of UX Design **3 Hours**

Understand the evolution of UX design as an industry practice and learning about UX industry experts, Design around us, Job roles and responsibilities in the UX industry,

Unit 2: Processes and Methodologies **3 Hours**

Understanding UX design processes and methodologies – user centred design, 5S model,

Unit 3: Tools and Technology in UX Design **6 Hours**

Tools, prototype, Industry standards, Technology, NFC, Chatbot, Siri

Unit 4: Multiple Domains and Trends in UX Design **6 Hours**

UX industry trends in various sectors

Unit 5: Project **27 Hours**

Project on UX design process and industry trends

Reference Books:

1. Designing for Digital Age: How to create human-centered products and services - Kim Goodwin
2. Sketching the User experiences - Bill Buxton
3. The design of everyday things - Don Norman
4. The elements of user experience - Jesse James Garrett

R A I P U R

Subject Name: History of Art and Evolution of Design
CODE: (BDESUX104) | CREDITS: 5 | HOURS: 75

Learning Outcomes:

- Get to know art forms in history
- To understand art in cultural context
- Able to comprehend evolution in Design and UX
- To envisage the paradigm shift in design as per the various technology changes

Unit 1: Art Forms in history	6 Hours
Understanding history of different art forms – modern art, contemporary art, classical art, renaissance art	
Unit 2: Historical interpretation of art	6 Hours
Art appreciation and historical interpretation of art in its cultural contexts.	
Unit 3: Evolution of design in everyday things	9 Hours
Understanding the evolution in design through forms and everyday things	
Unit 4: Paradigm Shift in Design from 19th century to modern time	9 Hours
Journey of design across in the 19th century to modern times.	
Unit 5: Project	45 Hours
Project submission on history of Art & design,	

Reference Books:

1. The story of the Art - Ernst Gombrich
2. Gardner's Art Through the Ages - Helen Gardner
3. Design by Evolution: Advances in Evolutionary Design - Luigi C. Barone

R A I P U R

Subject Name: Introduction to Visual Design
CODE: (BDESUX105) | CREDITS: 3 | HOURS: 45

Learning Outcomes:

- To understand the elements of visual design
- To master the creation of page layouts
- To Obtain and working knowledge of visual design tools
- To comprehend the application of elements and tools of visual design

Unit 1: Basic elements of visual design

3 hours

Introduction to basic elements of visual design – detailed study of color, color wheel, visual hierarchy, legibility and readability, grid, layout

Unit 2: Typography

6 hours

What is typography, Typeface's history and study, Types of fonts - serif and non-serif, Font anatomy, Importance of Typography in modern age UI design, Usage of type for print vs digital, Latest Trends in Typography

Unit 3: Iconography

6 hours

What is iconography, visualization of icons, industry standards and specifications for iconography, designing for various form factors, trends in iconography, User perception about iconography

Unit 4: Introduction to Visual Tools

3 hours

Introduction to visual design tools including lab session on elements of visual design and tools

Unit 5: Project work

27 hours

Project work in tools & elements of visual design

Reference Books:

1. Graphic Design The New Basics - Ellen Lupton and Jennifer Cole Phillips
2. The Visual Miscellaneum - David McCandless

R A I P U R

Subject Name: Design Communication & Visualizing Ideas
CODE: (BDESUX106) | CREDITS: 3 | HOURS: 45

Learning Outcomes:

- Get to know different visualization techniques
- To learn to generate new ideas
- To grasp the methods of presenting complex information visually
- To comprehend and effectively communicate the design ideas
- To apprehend the application of design communication and visualization

Unit 1: Visualization techniques 3 Hours

Learning visualization techniques through - visual identity design, metamorphism visualization techniques

Unit 2: Ideation Methods 3 Hours

Brainstorming and mind mapping.

Unit 3: Information Visualization 6 Hours

Information visualization through infographics and designing brand communication.

Unit 4: Communicating Design Ideas 6 Hours

Documenting and communicating design ideas through presentations, role play and group activities.

Unit 5: Project 27 Hours

Project in design communication and visualization 27 Hours

Reference Books:

1. Cool Infographics: Effective Communication with Data Visualization and Design – Randy Krum
2. Information Visualization: Perception for Design - Colin Ware

R A I P U R

Subject Name: Empathy & Understanding Problems
CODE: (BDESUX107)| CREDITS: 3 | HOURS: 45

Learning Outcomes:

- To understand the concept of empathy and empathizing with users effectively
- Discern the facts after dully analyzing the information received from the user
- To learn how to define the problem on the basis of facts
- To grasp various empathy techniques and tools
- To practice various tools to comprehend root cause of the problem leading to correct definition

Unit 1: Introduction to Empathy

3 Hours

What is Empathy, Learn how to understand users & their problems, techniques to empathize with users and identify key user problems.

Unit 2: Analyzing facts from Empathy to Dig Deeper

3 Hours

Learn how to gain insights from empathy and define problems statements

Unit 3: Empathy Tools and Techniques

6 Hours

Empathy tools – techniques for getting empathy insights through interviews

Unit 4: Application of Empathy in design

6 Hours

Empathy maps, emotional mapping, observation, field study with actual users

Unit 5: Project

27 Hours

Project submissions empathy mapping

Reference Book:

1. Empathy: Why it matters, how to get it - Roman Kizanie
2. The Art of Empathy: A complete Guide to life's most essential skill - Karla McLaren

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Year 1 Semester 2

Subject Name: Sketching & Drawing Advance
CODE: (BDESUX201) | CREDITS: 3 | HOURS: 45

Learning Outcomes:

- Draw from objects out of your head
- Understand the fundamentals of art
- Draw the human face and figure
- Draw realistic light and shadow
- Draw perspective drawings

Unit 1: Exploring mediums

3 Hours

Exploring color mediums like colored papers, color pencils, chalk, charcoal, ink etc.

Unit 2: Perspectives in Sketching and drawing

6 Hours

One point perspective, Two point perspective, Three point perspective, lettering, typo and Calligraphy

Unit 3: Illusions and human anatomy

6 Hours

Creating tessellation, Human anatomy, Print making, drawing – anatomy, storyboarding, illustration, painting

Unit 4: Real Life sketching

3 Hours

Application learning with still life, real life sketching, still life, nature

Unit 5: Project

27 Hours

Advanced Project on sketching & drawing

Reference Books:

1. Advanced Drawing Skills: A Course in Artistic Excellence - Barrington Barber
2. How to Sketch - Liron Yanconsky
3. The new drawing on the right side of the brain - Betty Edwards
4. The natural way to draw - Kimon Nicolaides

R A I P U R

Subject Name: Visual Design Tools
CODE: (BDESUX202) | CREDITS: 3 | HOURS: 45

Learning Outcomes:

- Be able to Design vector artwork
- Able to prepare graphics for web and print
- To implement useful keyboard shortcuts
- Learn illustrator the way a professional would use it
- Practice everything you learn during the course

Unit 1: Photoshop

3 Hours

Photoshop – Interface & Workspace, Modifying workspace, tools and layers, blending options

Unit 2: Photoshop Continued

6 Hours

Photoshop – layer effect filters, Image editing and enhancing, mixing, layer masking, External Plug-ins

Unit 3: Illustrator

3 Hours

Illustrator - Interface & Workspace, Modifying workspace, tools and layers, blending options

Unit 4: Illustrator Continued

6 Hours

Illustrator – working with vectors, object libraries, layer effect filters, Image editing and enhancing, mixing, layer masking, drawing, External Plug-ins

Unit 5: Project

27 Hours

Lab work on visual design tools, Project on visual design tools

Reference Books:

1. The Adobe Photoshop CC Book for Digital Photographers - Scott Kelby
2. Adobe Illustrator CC Classroom in a Book (2017 release) - Brian Wood

R A I P U R

Subject Name: Technology in Experience design
CODE: (BDESUX203) | CREDITS: 5 | HOURS: 75

Learning Outcomes:

- Get to know futuristic technologies and their implementation in design
- Able to comprehend technology constraints on design
- To Understand technology for digital experience and product ecosystems
- Research project in design using latest technology

Unit 1: Technology for digital experience 9 Hours

Understanding technology for digital experience and product ecosystems – form factors, operating systems, wifi, Bluetooth, sensors and other hardware components.

Unit 2: Technological feasibility and viability 6 Hours

Understanding technological feasibility and viability. Technology constraints on design.

Unit 3: Futuristic Technologies 9 Hours

Learning about futuristic technologies and their implementation in design, Wearable medical devices

Unit 4: Futuristic Technologies Continued 6 Hours

Details of Internet of Things, Augmented reality and virtual reality, ATM, KIOSK

Unit 5: Research Project 45 Hours

Research project on upcoming technologies and defining product ecosystems and constraints of key technologies

Reference Books:

1. Emotions, technology and design - Sharon Y. Tettegah
2. Augmented Reality: Principles and Practice - Dieter Schmalstieg
3. Augmented Reality: An emerging technologies guide - Gregory Kipper and Joseph Rampolla

R A I P U R

Subject Name: UX Design Advance
CODE: (BDESUX204) | CREDITS: 3 | HOURS: 45

Learning Outcomes:

- To be able to understand how UX works in different sectors
- Capable of comprehending real scenario in digital industries and understand effectiveness of UX Design
- To comprehend evaluation method and benefits in project
- Able to document and present evaluation data effectively

Unit 1: UX methodologies 3 Hours

Deep-dive in UX methodologies

Unit 2: Case Studies 6 Hours

Case studies in UX design

Unit 3: Heuristic evaluation 6 Hours

Heuristic evaluation

Unit 4: Product UX Lifecycle 3 Hours

Understanding product UX lifecycle.

Unit 5: Project 27 Hours

Project on UX design

Reference Books:

1. 100 things every designer needs to know about people - Susan Weinschenk
2. Don't make me think - Steve Krug
3. The UX Book - Rex Hartson and Pardha Pyla

RAIPUR

Subject Name: Basics of UI Development
CODE: (BDESUX205) | CREDITS: 5 | HOURS: 75

Learning Outcomes:

- To understand the basic structure of the web page
- To learn the basic concepts of HTML and CSS
- To learn CSS' role in creating user interfaces for mobiles and websites
- A deeper understanding of the DOM (document object model) and how CSS interacts with it.

Unit 1: Basic Development Learning front-end development technologies – HTML, Css, JavaScript, JQuery.	6 Hours
Unit 2: HTML Pages Structure of HTML Page, Mandatory tags in html page (html, head, body).	9 Hours
Unit 3: CSS What is CSS, Different ways of applying CSS for elements, and priority chain of CSS.	9 Hours
Unit 4: Attributes Heading tags (H1...H6), Tags and attributes (Class, Id, style etc.). Inline and block level elements	6 Hours
Unit 5: Project Project and lab in front-end-development	45 Hours

Reference Books:

1. Responsive web design with HTML 5 and CSS 3
2. CSS mastery: Advance web standards Solutions
4. HTML and CSS: Design and Build Websites
 - Ben Frain
 - Andy Budd
 - Jon Duckett

R A I P U R

Subject Name: Integrated studio for UX
CODE: (BDESUX206) | CREDITS: 5 | HOURS: 75

Learning Outcomes:

- Able to effectively apply the concepts of UX design to the live problem of organization.

Unit 1: Project on UX design implementation with industry relevant problem statement.



Communication Skill		
(BDESUX207)		
Unit No.	Details	
1	1.1 Introduction of Communication: 1.1.1 Purpose of Communication 1.1.2 Process of Communication 1.1.3 Difference between technical & General Communication 1.1.4 Types of Communication 1.1.5 Basics to Communication	8
2	2.1 Communication in Organisations: 2.1.1 Internal Communication – Stake Holders & channels in Internal Communication 2.1.2 External Communication- stake Holders & channels in External Communication 2.1.3 Communication Network- Scope & types, formal and Informal Communication Network 2.1.4 Language for Communication- General Principle, expressions & words to be avoided Grammar & usage	8
3	3.1 Writing Business Letter- 3.1.1 Importance, Structure, Format and types of Business Letters 3.2 Writing Memos, Circulars and Notice- 3.2.1 Importance, Structure, Format and Language of memo, circulars & Notice	8
4	4.1 Report Writing- 4.1.1 Features & Purpose of report Writing 4.1.2 Difference between business report & engineering report 4.1.3 Types of reports 4.1.4 Structure Format and language of report Writing	8
5	5.1 Meetings:- 5.1.1. Planning a Meeting 5.1.2. Agenda of Meeting 5.1.3. Minutes of Meeting 5.1.4. Structure and format of Agenda and minutes of meeting	8
Reference Book:- 1. Adais, John. Effective Communication London, Pan Macmillan LTd. 2003 2. Guffoy, Mary rller Essentials of Business Writing Ohio: South – western College pub. 2000 3. Hassan, Gill Brilliant Communication Skill Great Britain , Pearson Education ,2012		

Year 2 Semester 3

Subject Name: Ethnography and people design
CODE: (BDESUX301) | CREDITS: 5 | HOURS: 75

Learning Outcomes:

- To understand the users
- To understand the user's interaction with the environment, people and culture. To take part in different UX domains and societies
- Creating ethnography mood boards, user scenarios, storyboards, understanding research problems, data gathering techniques, perform field study to understand people design

Unit 1: Introduction to Ethnography and its Importance in UX	9Hours
History and Origin of Ethnography, How people think and feel, what motivates them, People are social, form and features of Ethnographic research, Theory and ethnography in modern anthropology of India	
Unit 2: Ethnography as method	9Hours
Conducting ethnographic research, Understanding cognitive and organizational psychology, evaluating ethnographic research data	
Unit 3: Introduction to semiotics	9Hours
History and meaning of semiotics, Basics of semiotics, Understanding Symbol, sign and Icon, difference between symbol, icon and sign, Signifier, signified and signification. Applications in real time world in the form of storytelling	
Unit 4: Elective- Ethnography study on Globalization	15 Hours
Plutchiks wheel of emotion, K-pop culture effect on design, Bollywood globalization, Study on how colonization changed the ethnography of regions, Nation branding around the world.	
Unit 5: Representation of Ethnographic data	9 Hours
Pictorial representation of the study in the form of painting, installation, product, etc.	
Assignments: Project in each unit	24 Hours

R A I P U R

Subject Name: Introduction to User Research
CODE: (BDESUX302) | CREDITS: 3 | HOURS: 45

Learning Outcomes:

- Be able to understand the importance of User research, Understanding the different user research methodologies
- Able to grasp hands-on experience of tools for user research
- Understanding cognitive psychology and user behavior.
- Performing a user research with users on a chosen problem

Unit 1: Introduction to User Research 3 Hours

Introduction to User Research and its Importance, Understanding User interactions

Unit 2: User Research methodologies 9 Hours

Planning for a User Research User Segment, defining persona for research & recruiting users, Preparing a Questionnaire for user research, Focus group discussion - do and don'ts, Online surveys - tools, do and don'ts, Analysis Interview Tips & Techniques

Unit 3: Field study: Hands on practice of methodologies 12 Hours

Preparing and Conducting Stakeholder workshop, Preparing questionnaire for Interviews, and Online surveys

Unit 4: Tools of Empathy and analysis 12 Hours

Tools of empathy like Persona, Empathy Map and User Journey Map, Documenting Qualitative Research, Documenting Quantitative Research

Unit 5: Project Work 9 Hours

Project work on User research

R A I P U R

Subject Name: Service Design and Task Flow
CODE: (BDESUX303) | CREDITS: 3 | HOURS: 45

Learning Outcomes:

- Understanding tasks, processes and systems
- Be able to find and execute user touch points, ecosystem diagram, value proposition map Using CJM to understand user flows
- Understanding task flows, creating task flows and systems engineering Learning KPIs for efficiency in service design and systems engineering Shortest path Service design in different domains
- Understanding task flow for operators

Unit 1: Introduction to service design Introduction to Service design, History with case studies	3 Hours
Unit 2: Basics of task flows What are task flows, basics to create task flows, Implementing into simple problems	9 Hours
Unit 3: Methodology of service design Defining the users involved with analytical tools, define the requirements for the service and its logical and organizational structure, Representation of the service by means of techniques that illustrate all the components of the service, including physical elements, interactions, logical links and temporal sequence, systems engineering	9 Hours
Unit 4: System Design for Public sector Public services include public goods and governmental services such as the military, police, infrastructure (public roads, bridges, tunnels, water supply, sewers, electrical grids, telecommunications, etc.), public transit, public education, along with health care and those working for the government itself, such as elected officials.	9 Hours
Unit 5: Project on System design for public sector Project based	15 Hours

R A I P U R

Subject: Information Architecture
CODE: (BDESUX304) | CREDITS: 5 | HOURS: 75

Learning Outcomes:

- Understanding Information architecture
- Tools and techniques of Information architecture
- Hands on using excel as a tool for card sorting
- Creating IA for different industries,
- Learning types and structures and structures of IA

Unit 1: Introduction to Information Architecture **12 Hours**

What is Information architecture, Structure, hierarchy and types of Information architecture, Principles and steps of Information Architecture

Unit 2: Tools and Techniques of Information architecture **12 Hours**

Learning affinity mapping, Card sorting, Analysis of Information architecture, Using excel as a tool for card sorting, Activity based.

Unit 3: Designing Information Architecture for business strategy and exploring gaps. **12 hours**

Designing Information Architecture for enterprise to meet its organizational goals using a tree structure. Making the case using the site mapping and content inventory and audit

Unit 4: Project **39 Hours**

Project submission implemented with Information architecture on any Industry

R A I P U R

Subject : Introduction to UI Design
CODE: (BDESUX305) | CRDITS: 3 | HOURS: 45

Learning Outcomes:

- Learning UI design guidelines for different platforms and operating systems
- Understanding the principles and fundamentals of UI Design.
- To be able to learn and get hands on Iconography & typography for interface design.
- To fundamentals of screen design based on design guidelines and Cross platform screen design.
- To master with the practical training in UI design for digital screens.

Unit 1: Basic elements of UI design

3 hours

Introduction to basic elements of visual design – detailed study of color, color wheel, visual hierarchy, legibility and readability, grid, layout

Unit 2: Typography

6 hours

What is typography, Typefaces history and study, Types of fonts - serif and non-serif, Font anatomy, Importance of Typography in modern age UI design, Usage of type for print vs digital, Latest Trends in Typography

Unit 3: Iconography

6 hours

What is iconography, visualization of icons, industry standards and specifications for iconography, designing for various form factors, trends in iconography, User perception about iconography

Unit 4: Introduction to Visual Tools

3 hours

Introduction to visual design tools including lab session on elements of visual design and tools

Unit 5: Project work

27 hours

Project work in tools & elements of visual design

Reference Books:

1. Graphic Design The New Basics - Ellen Lupton and Jennifer Cole Phillips
2. The Visual Miscellaneous - David Mc Candless

R A I P U R

Subject Name: Design thinking
CODE: (BDESUX306)| CREDITS: 3 | HOURS: 45

Learning Outcomes:

- Get to know what design thinking and wicked problem is
- To learn to generate new ideas
- To grasp the methods of the design thinking 5d process
- To comprehend and effectively use the tools and techniques to solve wicked problems
- To apprehend the application of design thinking with case studies

Unit 1: Introduction to Design thinking	3 Hours
Learning the meaning of design thinking and how it has evolved to solve wicked problems around the world, four pillars of wicked problems	
Unit 2: Design Philosophies	9 Hours
Deep dive into the Design process followed by Designers around the world	
Unit 3: Case studies in Design thinking	6 Hours
Getting to know the real-world applications and success stories of different industries	
Unit 4: Design Frameworks	12 Hours
AARRR framework, Customer Experience Index (CX Index), Google's HEART framework, Social Impact Metrics, IDEO, Stanford	
Unit 5: Project	15 Hours
Project on Design thinking	

RAIPUR

Subject Name: Information and Data Study
CODE: (BDESUX307) | CREDITS: 3 | HOURS: 45

Learning Outcomes:

- To understand the need of information and data study
- Discern the facts after dully analyzing the information received from the user
- To learn how to define the problem on the basis of facts
- To grasp various ecosystems for data
- To practice various tools to comprehend root cause of the problem leading to correct data study

Unit 1: Industry driven by data	3 Hours
Pharma- R&D driven by data, retail- shopping driven by data, E-commerce- what to show driven data, Banking- Personal finance management	
Unit 2: Sources of Data	3 Hours
Learn how to gain Google analytics, company internal data	
Unit 3: Defining Data driven UX	6 Hours
Learning how to define the data for the User experience, Case study on data driven UX	
Unit 4: Basics of Data analysis and information	6 Hours
What is information, actionable input from data collection, process of data analysis, parameters that UX designer can use (location, time, direction), data in the new IOT world-connected device data, What is big data and its effect on users/UX design	
Unit 5: Defining parameters for UX	27 Hours
Parameter for UX ROI, Parameters that can be collected and used about user, parameters about customer, how to define parameters	

R A I P U R

Year 2 Semesters 4

Subject Name: User Research application
CODE: (BDESUX401) | CREDITS: 3 | HOURS: 45

Learning Outcomes:

- The phenomenon of user research is learnt through hands on training
- Exploring different user research methodologies ensuring appropriate solution
- The tools for user research becomes familiar
- Introduction to basic cognitive psychology and user behavior
- Field experience on user researching through a pre-selected problem

Unit 1: Qualitative Research

9 Hours

Qualitative Research Project implementing Qualitative Research Strategy

Unit 2: Quantitative Research

3 Hours

Qualitative Research Project implementing Quantitative Research Strategy

9 Hours

Unit 4: Mental Models

Behavioral Psychology, Human Factor Design, use of empathy mapping and customer journey mapping to understand user needs

Unit 3: Research Planning

12 Hours

Detailed approach into the implementation of user research tools through workshops

Unit 5: Field research

12 Hours

Solving a pre chosen user problem performing an actual user research

R A I P U R

Subject Name: Service Design and task flow advance
CODE: (BDESUX402)| CREDITS: 3| HOURS: 45

Learning Outcomes:

- Case studies Introduction to task flows
- Methodologies of service design
- Hands on training with private sector companies

Unit 1: Complex service design case studies Follow through on various Case studies and success stories	12 Hours
Unit 2: Deep dive into task flows Learning to build complex task flows, Implementing into complex problems	9 Hours
Unit 3: Methodology of service design Learning analytical tools and systems engineering	9 Hours
Unit 4: System Design for private sector Learning through projects of MNC's, Hospitals, private roadway services etc.	15 Hours

RAIPUR

Subject Name: Introduction to Interaction Design
CODE: (BDESUX403) | CREDITS: 5 | HOURS: 75

Learning Outcomes:

- Learning the Importance and scope of Interaction design, User centered design
- Design of interactive products Methods of interaction design Tools for interaction design
- Get to know futuristic technologies and their implementation in design

Unit 1: Introduction to Interaction design 6 Hours

Understanding scope and history of interaction in design, case studies

Unit 2: User Centered design 12 Hours

What is User Centered Design? User-Centered Design Process, UCD is an Iterative Process, UCD Considers the Whole User Experience, Investment in UCD Pays off, Benefits of UCD and UX, UCD Waterfall process map

Unit 3: Design of interactive products 12 Hours
Ergonomics (Physical, cognitive and organizational)

Unit 4: Methods of interaction design 6 Hours

Learning the different methods which includes tools and techniques of interaction design, Understanding micro-interactions

Unit 5: Project
39 Hours
Project on Ergonomics

R A I P U R

Subject: UI Design advance
CODE: (BDESUX404) | CREDITS: 3 | HOURS: 45

Learning Outcomes:

- Advance UI interface designing
- Cross platform interface design and responsive design, UI concept and design guidelines
- UI design documentation and design delivery documentation, Understanding how UI/UX work in different sectors together

Unit 1: Advance UI Interface design 6 Hours

Creation of cross platform interface design and responsive design

Unit 2: UI Concept, design guidelines and tools 6 Hours

Introduction to UI design concept and guidelines and Zeplin

Unit 3: UI design documentation 3 Hours

The process of UI design documentation and design delivery documentation

Unit 4: Practical Project 30 Hours

Hands on training through Project on interface designing



RAIPUR

Subject: Design thinking application
CODE: (BDESUX405)| CREDITS: 3 | HOURS: 45

Learning Outcomes:

- Deep dive into complex wicked problems to solve them through strategies
- To be able to understand the various ways in which innovative products can be built, To be able to follow the 5d process from scratch
- Understanding in the way of business advantages

Unit 1: Advance tools in Design thinking 6 Hours

Learning tools like value proposition mapping and canvas, Feature mapping and ROI mapping

Unit 2: Business advantage of Design thinking 3 Hours

Case studies and aspects of design thinking on business of various sectors, Design Management, Product lockdown

Unit 3: Practicing product lockdown 6 Hours

UI design documentation, design delivery documentation

Unit 4: Strategic design thinking 30 Hours

Project based: Strategic Product design (prototypes) and making wearable devices with UX in it

RAIPUR

Subject : Data Analytics
CODE: (BDESUX406)| CREDITS: 3 | HOURS: 45

Learning Outcomes:

- Able to effectively apply the concepts and psychology so as to analyze big and complex data
- To be able to understand the tool and fetch data in a structured form
- To be able to read, structure, segment and conclude the heavy information

Unit 1: Data in UX Design	6 Hours
Revisit of data driven UX, data driven card sorting, data driven user research, data driven user testing	
Unit 2: Data in service design	9 hours
Task flows and data, Efficiency and data, case study	
Unit 3: Data in decision for leadership	6 hours
How to create actionable dashboard, drill down of data (layers)	
Unit 4: Gamification and Data analysis	9 hours
Scores in gamification, badges and data	
Unit 5: Engagement and data analysis	6 hours
How to provide engagement and personalization with data	
Project	9 hours

RAIPUR

Subject: Introduction to 6D
CODE: (BDESUX407)| CREDITS: 5 | HOURS: 75

Learning Outcomes:

- Learning to design with 6D process
- Implementation of different tools and techniques at correct form and place
- Use of advance technology and hands-on implementation on the project
- Practice sessions to concretize the skills learnt

Unit 1: Discover

15 Hours

Gap Finding, empathize with stakeholders and users to understand the problem, Find the unmet needs and expectations of the user, analyze data and trends, ask questions relevant to receive insights to the problem,

Unit 2: Define

15 Hours

Problem Statement, Define the problem using mental models, Define the user, Define the context of the user, define the User Personas, User Scenarios, Task Analysis

Unit 3: Dream and Design

15 Hours

Ideate for maximum number of solutions, Define an evaluation criteria, Strategize the idea to base your design solution on, Create the Information Architecture and set priorities, Wire framing and Prototyping, Mockups

Unit 4: Dryrun

15 Hours

Test and Iterate, A/B Testing, Tool Based Testing

Unit 5: Project

15 Hours

Project on implementation of 6D process in any service/product

R A I P U R

Year 3 Semester 5 Credits

Subject: WIREFRAMING & PROTOTYPING
CODE: (BDESUX501) | CREDITS: 3 | HOURS: 45

Learning Outcomes:

- Practice to learn the tools required to design wireframes and prototypes.
- Design wireframes on paper and translate paper concepts into digital wireframes.
- Understand and practice the techniques involved in designing digital wireframes for UI Platforms.
- Understand and practice the techniques involved in designing digital wireframes for HMI and other digital screens.
- Understand and practice the techniques involved in creating digital prototypes.
Tools to be taught – AxureRP, invision

Unit 1: Basics guidelines of Wireframing 6 Hours

Introduction to wireframes, understanding responsive design, primary, secondary and utility navigation, content, inline links, indexes, search

Unit 2: Designing wireframes on paper 9 Hours

Header, footer, sidebar, navigation systems, use of whitespace, web fonts and typography

Unit 3: Designing wireframes on Axure/Invision 9 Hours

Creating visual mockups, whitespace to style a form, scrolling, introduction to clickable prototypes, introduction to Axure and Invision, importing and exporting assets, creating hotspots

Unit 4: Designing digital wireframes for different UI platforms 9 Hours

Practical hands-on demonstration of paper-based wireframes and clickable prototypes using digital tools

Practice and Project based – Designing for Web, Mobile Application, IOS, wearable 12 Hours

RAIPUR

Subject: USABILITY TESTING
CODE: (BDESUX502)| CREDITS: 5 | HOURS: 75

Learning Outcomes:

- Learn the process of conducting usability tests Learning steps for digital products
- Learning Preparations for usability testing Understanding Usability testing methodologies
- To able to Conduct the Usability testing and document it

Unit 1: Process of Usability testing

9 Hours

What is Usability testing, Types of testing, Learning the steps to test different types of products/service/methods- planning, executing, information gathering and documentation, case studies

Unit 2: Usability testing for Digital products

9 Hours

Learn how to create questionnaires, test cases and test moderation. Preparing for the testing of products, Understanding people's psychology and Behavior

Unit 3: Tools and Techniques of Usability Testing

12 Hours

Usability testing methodologies – task based user testing, A/B testing, lab based user testing, remote user testing, moderated & un-moderated user testing

Unit 4: Project Work

45 Hours

Project work on Usability Testing- students will pick up a real-life digital application and conduct end-to-end usability testing on the product and submit a report for evaluation.

RAIPUR

Subject: UX & DIGITALIZATION
CODE: (BDESUX503) | CREDITS: 5 | HOURS: 75

Learning Outcomes:

- Understanding different technologies
- Be able to find and execute technologies keeping in mind user
- To be able to perform Research and design for all industry segments using a toolkit.

Unit 1: UX and digitalization in different industry segments 15 Hours

Understand by case studies how technology and digitalization is transforming different industry segments

BFSI, manufacturing, retail, automotive, media, FMCG, logistics, oil & gas. Learning to

Project Work 60 Hours

Project work on any one industry



RAIPUR

Subject: INNOVATION MANAGEMENT
CODE: (BDESUX504) | CREDITS: 3 | HOURS: 45

Learning Outcomes:

- Understand the roles of skill, experience, motivation and culture in creative endeavor
- Appreciate how the perspective taken on creativity affects the policy used to engender it
- Differentiate between radical and incremental innovation
- Identify some potential disruptive innovations and take advantage of 'open' innovation
- Reflect on experiences of creativity and innovation at work.

Unit 1: Innovation & Creativity **6 Hours**

What is Innovation? What is creativity? Difference between innovation and creativity, dynamics of creative thinking, becoming creatively fit as an individual, creative insight, idea generation

Unit 2: Innovation in organizations **9 Hours**

Learn what is innovation and how leading organization across the world are implementing innovation, Role of creativity and innovation in organizations, idea evaluation, creativity in teams, team's environment and creativity, creating climate for creativity and an enterprise, creating an environment that keeps creative people creating, managing creative employees, leading for creativity and innovation, creativity to innovation, Success stories

Unit 3: innovation Management Process **9 Hours**

Understanding what is Innovation management, Learn the 4 pillars of innovation, innovation maturity matrix and the innovation management process – problem identification, ideation, and implementation. Understanding innovation as a culture Innovation management tools – user study, social listening, customer care reports, data analytics, hackathons, paper prototyping, digital roadmap, market gap analysis, commercialization.

Unit 4: Project **21 Hours**

Research and implementing innovation management process for different industry segments.

R A I P U R

Subject : Visual design tools advance
CODE: (BDESUX505) | CREDITS: 5 | HOURS: 75

Learning Outcomes:

- To be able to master the tools like illustrator and Photoshop for advance level concepts

Unit 1: Illustrator	30 hours
Learning and Practicing Advance level tool practice in visual concepts, typography, iconography, Visual elements	
Unit 2: Photoshop	30 hours
Advance level tool practice in interface design for cross-platform, responsive, and web.	
Project on the subject	15 hours



RAIPUR

Subject: Technology in Experience design advance
CODE: (BDESUX506) | CREDITS: 3 | HOURS: 45

Learning Outcomes:

- Learn why UX approach in Tech is needed
- Learn about Agile thinking
- Dive into UX and its practices in technology

Unit 1: Tech and UX

6 Hours

Understand how software teams work, roles of different profiles; front end and back end, types of technologies for back end and front end, constraints of each technology

Unit 2: Introduction to SDLC

9 Hours

Types, pros and cons of SDLC, what are the processes that they use and frameworks that they use. Learn SDLC methodologies such as agile, lean, and traditional/waterfall – pros & cons of each process.

Unit 3: Agile and design thinking Framework

9 Hours

Deep dive into agile process, case studies, Framework of agile, The State of UX Agile Development, Agile Process Is Flexible, Top 10 Tips for UX Success From Agile Practitioners

Unit 4: Ecosystem project

21 Hours

Understanding product ecosystems for futuristic technologies – industry 4.0, Practice – Project in SDLC in any one domain (eg; E-commerce, healthcare, BFSI, Manufacturing)

RAIPUR

Subject: Omni-channel experience design
CODE: (BDESUX507) | CREDITS: 3 | Hours: 45

Learning Outcomes:

- To understand the concept of Omni channel design To learn how to build omni channel experience
- To grasp various key elements of building an Omni-channel experience
- To practice and create Omni-channel User Experience to Increase Customer Engagement

Unit 1: Introduction to Omni channel experience design **9 Hours**

What is Omni-channel experience design, Why do we need omni channel ux , understanding all Omni-channel experiences will use multiple channels, but not all multi-channel experiences are Omni-channel. Multichannel vs. Omni channel

Unit 2: Case studies **9 Hours**

Bank of America’s Omni-channel UX, Sephora’s Omni channel UX, Walgreens’ Omni channel UX, Caratlane and Tanishq, Fab Furnish and Home Center at future groups

Unit 3: Building Omni channel experiences **9 Hours**

Elements of Omni channel experiences, learn how to design omni-channel experiences – Mobile, web, wearable, cloud. Customer service and offline touch points. Designing omni-channel product ecosystems and Design multi-channel interaction patterns.

Project: **18 Hours**

Practice – Omni-channel User Experience Best Practices to Increase Customer Engagement

R A I P U R

Year 3 Semesters 6

Subject: Interaction design advance
CODE: (BDESUX601) | CREDIT: 5 | HOURS: 75

Learning Outcomes:

- To be able to understand micro-interactions in detail Have a hands-on tools and prototyping practice
- To be able to generate new ideas
- Get to understand technologies and connect with emotional design

Unit 1: Introduction to micro-interactions

6 Hours

To evoke emotions and activity (to compel the user to do something), four triggers of micro-interactions.

Unit 2: Rapid prototyping techniques

9 Hours

Tools and methods of rapid prototyping for idea generation Crazy 8, Scamper, 6 thinking hat

Unit 3: Multi-Screen Interaction design 12 Hours

Service design case studies - ATM/Healthcare for multi-screen interaction design Practice & Project based

Unit 4: Designing for futuristic technologies

15 Hours

Interaction design for gesture controls. Designing interactions for futuristic technologies – voice, AI. Project based on sound/voice and gesture controls

Unit 5: Emotional Design

15 Hours

7 types of emotions- Example as case study for each emotion. Develop your own emotional study on any product/situation. How to manage emotions in interaction design. E.g.: Nostalgic in social media (Facebook feature)

Project:

30 Hours

RAIPUR

Subject: UX Design for futuristic technologies
CODE: (BDESUX602) | CREDIT: 3 | HOURS: 45

Learning Outcomes:

- To be able to have an understanding on futuristic technologies To be able to practice and implement technologies in new ideas
- To be able to implement after understanding on different platforms

Unit 1: Designing for AR

12 Hours

What is augmented reality, Examples, Case studies on augmented reality, implementing augmented reality in different industry domains

Project based

Unit 2: Designing for VR

12 Hours

What is virtual reality, Examples, Case studies on virtual reality, implementing augmented reality in different industry domains

Project based

Unit 3: Introduction to Internet of things (IOT)

12 Hours

What is Internet of things, Examples, Case studies on IOT, Implementing IOT in different industry domains

Project based

Project:

9 Hours

RAIPUR

Subject: UX Design for rural India
CODE: (BDESUX603) | CREDIT: 3 | HOURS: 45

Learning Outcomes:

- Understanding the need of innovation in rural areas To
- be able to understand the users and suggest ideas
- To able to create ethnography study and analyze it Improve the experience with digitalization

Project based:

45 Hours

Ethnographic study of rural India. Creating UX for low bandwidth regions. Digitalization for the bottom of the pyramid. Localization of experience



Subject: UI Development advance
CODE: (BDESUX604) | CREDIT: 5 | HOURS: 75

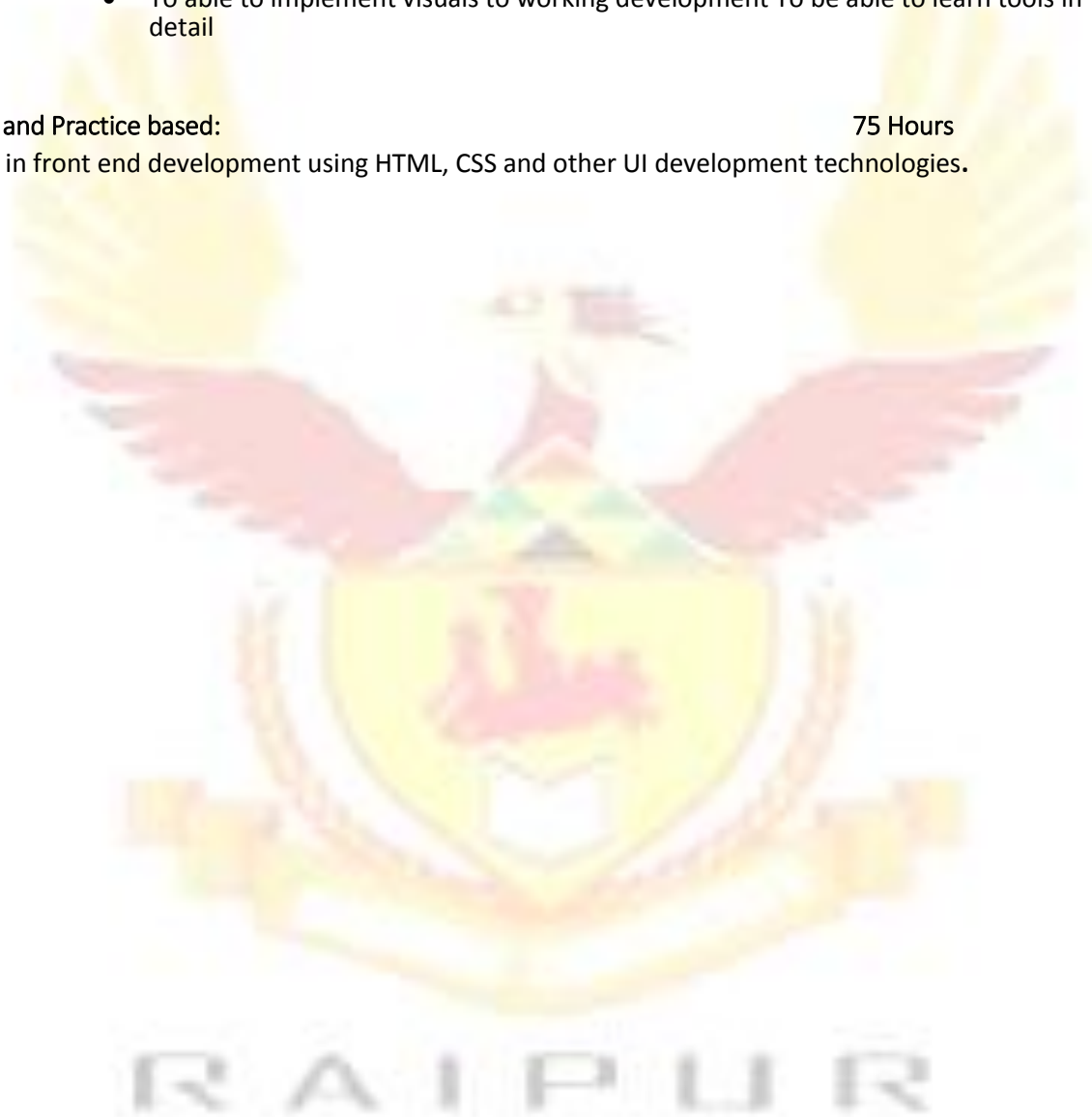
Learning Outcomes:

- Understanding the guidelines for front end developer and back end developer
- To be able to understand the language of designers and developers
- To able to implement visuals to working development To be able to learn tools in detail

Project and Practice based:

75 Hours

Project in front end development using HTML, CSS and other UI development technologies.



Subject: Industry specific UX design
CODE: (BDESUX605) | CREDIT: 3 | HOURS: 45

Learning Outcomes:

- To be able to implement the grasp the different industries
- To be able grasp the working and concepts of different domains

Project based:

45 Hours

Experience design case studies in banking, retail, insurance, media, healthcare, pharma, logistics & travel, education.



Subject: Integrated studio for UX – Advance
CODE: (BDESUX606) | CREDIT: 5 | HOURS: 75

Learning Outcomes:

- To be able to implement the learnings in a project on any one industry

Project based: On UX design implementation with industry relevant problem statement including 6D process



Subject: Environmental Science
CODE: (BDESUX607) | CREDIT: 5 | HOURS: 75

UNIT – I

General: Environmental segments, environmental degradation, environmental impact assessment.

Concept of Ecosystem: Fundamental of Ecology and Ecosystem, components of ecosystem, food-chain, food-web, trophic levels, energy flow, cycling of nutrients, major ecosystem types (forest, grass land and aquatic ecosystem).

UNIT – II

Air Pollution: Atmospheric composition, energy balance, classification of air pollutants, source and effect of pollutants – Primary (CO, SO_x, NO_x, particulates, hydrocarbons), Secondary [photochemical smog, acid rain, ozone, PAN (Peroxy Acetyl Nitrate)], green house effect, ozone depletion, atmospheric stability and temperature inversion, Techniques used to control gaseous and particulate pollution, ambient air quality standards.

UNIT – III

Water Pollution: Hydrosphere, natural water, classification of water pollutants, trace element contamination of water, sources and effect of water pollution, types of pollutants, determination and significance of D.O., B.O.D., C.O.D. in waste water, Eutrophication, methods and equipment used in waste water treatment preliminary, secondary and tertiary.

UNIT – IV

Land Pollution & Noise Pollution: Lithosphere, pollutants (agricultural, industrial, urban waste, hazardous waste), their origin and effect, collection of solid waste, solid waste management, recycling and reuse of solid waste and their disposal techniques (open dumping, sanitary land filling, thermal, composting).

Noise Pollution: Sources, effect, standards and control.

UNIT – V

Environmental Biotechnology: Definition, current status of biotechnology in environmental protection, bio-fuels, bio-fertilize, bio-surfactants, bio-sensor, bio-chips, bio-reactors.

Pollution Prevention through Biotechnology: Tannery industry, paper and pulp industry, pesticide industry, food and allied industry.

Text Books

1. Environment and Ecology by Piyush Kant Pandey and Dipti Gupta (Sum India Publication)
2. A Textbook of Environmental Chemistry and Pollution Control by S.S. Dara (S. Chand and Company)

Reference Books:

1. Masters, G.M. Introduction to Environment Engineering and Science (Prentice Hall of India).
2. Environmental Chemistry by A.K. Dey (Eastern Ltd.).
3. Environmental Chemistry by B.K. Sharma (Krishna Prakashan).
4. Nebel B.J. Environmental Science (Prentice Hall of India-1987).
5. Environmental Biotechnology by S.N. Jogdand (Himalaya Publishing House).
Introduction to Environmental Biotechnology by A.K. Chatterji (Prentice Hall of India).

Year 4 Semester 7

Subject: Gamification and UX Design
CODE: (BDESUX701) | CREDIT: 3 | HOURS: 45

Learning Outcomes:

- To understand the strategy of gamification
- To learn the key ingredients of gamification
- To implement gamification for customer engagement
- Creating appeal in UX design by gamification

Unit 1: Introduction to Gamification

6 Hours

What is Gamification? Why is gamification so popular? Key ingredients of gamification – Motivation, mastery and triggers, Why and how gamification is not the same as game design

Unit 2: Strategy of Gamification

9 Hours

The appeal of gamification in UX Design, Challenges in gamification, The power of gamification and how it can increase user engagement and fulfilment, How to manage, monitor, and measure of the impact of gamification work

Unit 3: Gamification – The play centered design

12 Hours

Gamification in UX -Increasing User Engagement, Types of game mechanics for UX improvement, Player-Centred Design: Moving Beyond User-Centred Design for Gamification

Unit 4: Project

18 Hours

Implementing Gamification in banking, healthcare, retail or management portal

R A I P U R

Subject: Human Machine Interface
CODE: (BDESUX702) | CREDIT:5 | Hours:75

Learning Outcomes:

- Be able to understand the interactions between human and machine
- Understanding the different machines
- Able to grasp hands-on experience of tools for creating interfaces for human and machine
- Understanding cognitive psychology and user behavior.
- Implementing the study to create interfaces for human machine interactions

Unit 1: Introduction to HMI

9 Hours

What is HMI? Who Uses HMI? Common Uses of HMI, What is the Difference Between HMI and SCADA?

Unit 2: Trends in HMI Technology

15 Hours

Understanding the different technologies of HMI, Past trends and current technologies, High-Performance HMIs, Touch Screens and Mobile Devices, Remote Monitoring, Edge-of-Network and Cloud HMIs Case studies in detail

Unit 3: Futuristic HMI's

9 Hours

Understanding the current trends, exploring ways to implement Augmented Reality (AR) and Virtual Reality (VR) to visualize manufacturing functions.

Unit 4: Project Work

42 Hours

Project work on HMI which includes current trends

R A I P U R

Subject: Product design & lifecycle management
CODE: (BDESUX703) | CREDIT: 5 | Hours: 75

Learning Outcomes:

- Understanding the cycle of product design
- Be able to find and excute the technology required
- Understanding the importance of product management
- To be able to execute the cycle of product management

Unit 1: Introduction to Product lifecycle management 6 Hours

What is Product Lifecycle Management (PLM)? What is the Product Life Cycle? Product life cycle stages, Benefits, areas of PLM

Unit 2: Product Development Platform 12 Hours

PLM, Supply Chain Collaboration, ALM and QMS, Multi-Tenant Cloud-Based, PLM Software, How Arena Provided the All-In-One Product Development Platform Apical Instruments Needed. Phases of product lifecycle and corresponding technologies.

Unit 3: Product Lifecycle Management Integration 12 Hours

Rootstock Product Lifecycle Management Integration, Shared Product Information, How the Integration Works,

Unit 4: Project Work 45 Hours

Project work on PLM

RAIPUR

Subject Name: Business UX and design management
CODE: (BDESUX704) | CREDIT: 5 | HOURS: 75

Learning Outcomes:

- Understanding business in UX
- Understanding the strategy involved in UX business
- Understanding design management
- Implementing design management in product design and business

Unit 1: Business UX

12 Hours

Understanding How a UX approach can help any business, The Business Value of UX Design, Strategy building, Aspects of key guidelines in UX business, values and emotions of user Behavior and cognitive psychology of market and business, Design policies

Unit 2: Design Management

15 Hours

What is design management, Different types, Taking Charge of Processes and People The Evolution of Design Management, Areas of Design Management, Why Does Design Management Matter?, Where Does Design Management Fall Within Businesses?

Unit 3: Project

48 Hours

Understanding Design management and UX business

R A I P U R

Subject Name: Live Project
CODE: (BDESUX705) | CREDITS: 5 | HOURS: 45

Live Project should be in any one domain and should be technology driven and aesthetically done to be able to strategically prove its importance in the real-time world.



Year 4 Semester 8

Subject Name: Degree Project

CODE: (BDESUX801) | CREDITS: 27 | HOURS: 405

Learning Outcomes:

- Industry project to be completed in semester 8 as an internship.
- Projects reports are to be submitted in a set format and mentors are assigned to each student for guidance through the project.
- The project is evaluated as the end-term examination in the form of a jury conducted by an industry and academic panel.

