Bachelor of Design (B-Des) Curriculum April - 2016

Bachelor of Design (B-Des)

Course Structure

PDPM- Indian Institute of Information Technology, Design and Manufacturing Jabalpur
Overview of Bachelor of Design (B-Des) Course Structure: April2016

		Course Name	Lecture	Tutorial	Practical	Contact hours	Credit
Year 1st	Semester I	1. DS 103 Design Fundamentals 1	2	0	2	4	4
		2. DS 104 Design Drawing	1	0	3	4	3
		3. DS 105 Science in Design	2	0	2	4	4
		4.IT 101 Fundamentals of Computing **(Common Course)**	2	0	3	5	4
		5. HS 101 Communication **(Common Course)**	1	0	1	2	2
		Total	**8**	**0**	**11**	**19**	**17**
	Semester II	1. DS 101 Engineering Graphics **(Common Course)**	2	0	3	5	4
		2. DS 106 Design Fundamentals 2	2	0	2	4	4
		3. DS 107 Introduction to Ergonomics in Design	2	0	2	4	4
		4. DS 108 Representation Techniques	2	0	2	4	4
		5. DS 109 Software Skills	0	0	3	3	2
		6. DS 110 Design Project 1	0	0	6	6	4
		Total	**8**	**0**	**18**	**26**	**22**
Year 2nd	Semester III	1. DS 211 Design Arts and Aesthetics	2	0	2	4	4
		2. DS 212 Studies in Form	2	0	2	4	4
		3. DS 213 Design Thinking	2	0	2	4	4
		4. DS 214 Industrial Design 1	2	0	2	4	4
		5. DS 215 Communication Design 1	2	0	2	4	4
		6. DS 216 Design Project 2	0	0	6	6	4
		Total	**10**	**0**	**16**	**26**	**24**
	Semester IV	1. DS 217 Design Research Including User Study	2	0	2	4	4
		2. DS 218 Packaging Design and Branding	2	0	2	4	4
		3. DS 219 Materials and Processes	2	0	2	4	4
		4. DS 220 Industrial Design 2 (Compulsory)	2	0	2	4	4
		5. DS 221 Communication Design 2 (Compulsory)	2	0	2	4	4
		6. DS 222 Design Project 3	0	0	6	6	4
		Total	**10**	**0**	**16**	**26**	**24**
Year 3rd Cont....	Semester V	1. DS 302 Engineering Design **(Common Course)**	2	0	4	6	5
		2. DS 323 Service Design	2	0	2	4	4
		3. DS 324 Sustainable Design	2	0	2	4	4
		4. DS 325a Applied Ergonomics (Elective) **OR** DS 325b Visual Ergonomics (Elective)	2	0	2	4	4
		5. DS 326 Design Project 4	0	0	6	6	4
		Total	**8**	**0**	**16**	**24**	**21**

		Course Name	Lecture	Tutorial	Practical	Contact hours	Credit
Year 3rd	Semester VI	1. DS 327 Interface Design	2	0	2	4	4
		2. DS 328 Design Forecasting and Trend Research	2	0	2	4	4
		3. DS 329 Design Management	3	0	1	4	4
		4. DS 330a Industrial Design Elective 1**OR** DS 330b Communication Design Elective 1	2	0	2	4	4
		5. MN303 Design Project 5(Fabrication Project)	0	0	0	6	4
		6. DS 301Computer Aided Process and Planning	2	0	2	4	4
		7. HS 4 Environmental Science **(Common Course)**	3	0	0	3	4
		Total	**14**	**0**	**9**	**29**	**28**
Year 4th	Semester VII	1. DS 496 Design Seminar 1	0	0	0	1	2
		2.DS 498 Design Thesis1	0	0	0	2	16
		Total	**0**	**0**	**0**	**3**	**18**
	Semester VIII	1. DS 497 Design Seminar II	0	0	0	1	2
		2. DS 499 Design Thesis 2	0	0	0	2	16
		OR 2. Course work (Four Electives)					
		1. DS 431a Industrial Design Elective 2	2	0	2	4	4
		2. DS 431b Industrial Design Elective 3	2	0	2	4	4
		3. DS 431c Industrial Design Elective 4	2	0	2	4	4
		4. DS 431d Industrial Design Elective 5	2	0	2	4	4
		OR					
		1. DS 432a Communication Design Elective 2	2	0	2	4	4
		2. DS 432b Communication Design Elective 3	2	0	2	4	4
		3. DS 432c Communication Design Elective 4	2	0	2	4	4
		4. DS 432d Communication Design Elective 5	2	0	2	4	4
		Total	**8**	**0**	**8**	**19**	**18**

N.B.

- One Lecture = 01 hr.
- One Tutorial = 01 hr.
- One Practical = 01 hr.

Program Credits = 172

Total Program Contact hours = 172

Bachelor of Design (B-Des)

Course Content

Semester I

B-Des

Subject Code: DS 103 **Course Title:** Design Fundamentals 1

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/1

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Introduction to design – Nature of design, Aesthetic sense, Role of perception, Gestalt principle, Inspiration, concepts, problem solving Product integrity (consistency between a product's function with its structure and customer expectations)
[07H Lecture,+3H Lab]

Originality (originality in technology and form; plagiarism) Craftsmanship required transforming an idea to a product etc. An introduction to basic elements of Design: Point, Line – Line as Expression, Quality of lines, Symbolic Lines, Line as form etc. Space – Pictorial space, implied space, space illusion, actual space etc**.** **[07H Lecture,+3H Lab]**

Shape & Form– Natural shapes, geometric shapes, abstract shapes, non-representational shapes; Natural forms, geometric forms, abstract forms, non-objective forms**.** **[07H Lecture,+3H Lab]**

Color – color theory, color properties, color relationships, color harmony, color interaction. Texture - tactile texture, visual texture, texture and pattern, constructed textures, symbolic textures
[07H Lecture,+3H Lab]

Course Books:

1. *Bervin, M. E. (1984). Design Through Discovery: The Element and Principles. Holt, Rinehart and Winston, Washington.*
2. *Wong, W. (1972). Principles of two-dimensional design. John Wiley & Sons. Sherwin, D. (2010). Creative workshop: 80 challenges to sharpen your design skills. How Books.*

Reference Books:

1. *Brommer, G. F. (1994). Collage techniques: A guide for artists and illustrators. Watson-Guptill Publications. Kelley, T., & Kelley, D. (2013). Creative confidence: Unleashing the creative potential within us all. Crown Business.*

Subject Code: DS 104 **Course Title:** Design Drawing

Contact Hours: L-1 **T** -0 **P**-3

Credit: 3 **Course type:** Professional **Program/Semester:**B.Des/1

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Including a combination of engineering and artistic drawing skills**.** **[07H Lecture,+3H Lab]**

Free hand drawing from natural or manmade environment develops the skill of coordination of mind and hand during the process of representation**.** **[07H Lecture,+3H Lab]**

Free hand drawing of Isometric (30^0-30^0), Diametric (15^0-15^0), Trimetric (45^0-15^0) and One point. **[07H Lecture,+3H Lab]**

Two point and Three point perspective in real location. **[(07H Lecture,+3H Lab]**

Course Books:

1. *Nicolaides, K. (1990). The natural way to draw: A working plan for art study. Houghton Mifflin Harcourt.*
2. *Laning, E. (1971). The act of drawing. McGraw-Hill Companies.*
3. *Ching, F. D., & Juroszek, S. P. (2010). Design drawing. John Wiley & Sons.*

Reference Books:

1. *O'Rourke, N., Psych, R., & Hatcher, L. (2013). A step-by-step approach to using SAS for factor analysis and structural equation modelling. Sas Institute.*
2. *Speed, H. (2012). The practice and science of drawing. Courier Corporation.*

Subject Code: DS 105 **Course Title:** Science in Design

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/1

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Fundamental Theories of Science. **[07H Lecture,+3H Lab]**
Science behind popular material innovation. **[07H Lecture,+3H Lab**
Mechanism and Mechanical Devices. **[07H Lecture,+3H Lab]**
Science of Proportion and Geometry, Practical Electronics, Do It Your Self Techniques**.[07H Lecture,+3H Lab]**

Course Books:

1. *Sclater, N., & Chironis, N. P. (2001). Mechanisms and mechanical devices sourcebook (Vol. 3). New York: McGraw-Hill.*
2. *Roberts, D. (2010). Making Things Move DIY Mechanisms for Inventors, Hobbyists, and Artists. McGraw Hill Professional.*
3. *Geier, M. J. (2011). How to Diagnose and Fix Everything Electronic. McGraw-Hill.*

Reference Books:

1. *Scherz, P. (2006). Practical electronics for inventors. McGraw-Hill, Inc.*

Subject Code: IT 101 **Course Title:** Fundamental of Computing

Contact Hours: L-2 **T** -0 **P**-3

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/1

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Concept of Programming Languages, A quick overview of OS-Windows/Linux, Writing, compiling and running the program on Linux/Windows, The Compiler, Program Builder, Debugging: types of errors and debugging techniques, Problem solving aspects, Introduction to Algorithms and flow charts, Data structures in C, Variables, Variables names, I/O, The standard Input/output file, Formatted inputs/Output, Expressions and Operators, connectors, control statements, Functions: Scope of Function variable, Modifying function arguments, Pointers, Array, String, Structures and Unions, file handling, File redirection, file pointers, advantages of using multi files, organization of data in each file, compiling multi-file programs, The Pre-processor, Library Functions and Low level programming.

Course Books:

1. *Balagurusamy, E. (2002). Programming in Ansi C. Tata McGraw-Hill Education.*
2. *Kernighan, B. W., & Ritchie, D. M. (1988). The C programming language (Vol. 2). Englewood Cliffs: prentice-Hall.*

Reference Books:

1. *Kanetkar, Y. P. (2008). Let us C. Jones and Bartlett Publishers, Inc.*
2. *"The Complete Reference C", Hebert Schildt, Tata McGraw-Hill Education.*

COMMON COURSE OFFERED BY CSE ALONG WITH B.TECH STUDENTS

Subject Code: HS 101 **Course Title:** Effective Communication

Contact Hours: L-1 **T** -0 **P**-1

Credit: 2 **Course type:** Professional **Program/Semester:**B.Des/1

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

English speaking and writing, presentation skills, facing an interview, selling an idea etc.

COMMON COURSE TO BE OFFERED BY HSS ACROSS ALL THE DISCIPLINES

Semester II

B-Des

Subject Code: DS 101 **Course Title:** Engineering Graphics

Contact Hours: L-2 **T** -0 **P**-3

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/2

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Lines, Lettering, Sketching, Principle of Dimensioning, Orthographic Projection: Projection of Points, Lines, Planes, Auxiliary Views, Projection of Solids, Sections of Solids, Intersections of solids and development of lateral surfaces of simple solids, Isometric Projections, Oblique and Perspective Projection.

Course Books:

1. *Loader, W. J. (1992). Introduction to Engineering Drawing: The Foundations of Engineering Design and Computer Aided Drafting. Prentice Hall PTR.*

COMMON COURSE OFFERED BY CSE ALONG WITH B.TECH STUDENTS

Subject Code: DS 106 **Course Title:** Design Fundamental 2

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/2

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Understanding of characteristics of different elements & their inter-relationship with various elements and to the composition. **[07H Lecture,+3H Lab]**

Balance – Structural balance and visual balance**.** **[07H Lecture,+3H Lab]**

Materials, hardware and software etc**.** **[07H Lecture,+3H Lab]**

Symmetry, Asymmetry, Radial Balance, Golden proportion, Rules of composition, Scale & Proportion - Unity & Variety – Harmony, Rhythm, Perspective, Emphasis, Orientation, and Repetition. **[07H Lecture,+3H Lab]**

Course Books:

1. *Bervin, M. E. (1984). Design Through Discovery: The Element and Principles. Holt, Rinehart and Winston, Washington.*
2. *Wong, W. (1972). Principles of two-dimensional design. John Wiley & Sons.*

Reference Books:

1. *Brommer, G. F. (1994). "Collage techniques: A guide for artists and illustrators" Watson-Guptill Publications.*

Subject Code: DS 107 **Course Title:** Introduction of Ergonomics in Design

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/2

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Genesis. Systems concepts, evolution. **[07H Lecture,+3H Lab]**
Components, biomechanics, anthropometry**.** **[07H Lecture,+3H Lab]**
Application, relation to design, ergonomics of product, space and communication**[07H Lecture,+3HLab]**
Sector specific application of ergonomics like craft, agriculture, transportation etc**[07H Lecture,+3H Lab]**

Course Books:

1. *Bridger, R. (2008). Introduction to ergonomics. Crc Press.*
2. *Chakrabarti, D. (1997). Indian anthropometric dimensions for ergonomic design practice. National institute of design.*

Reference Books:

1. *Sanders, M. S., & McCormick, E. J. (1987). Human factors in engineering and design McGraw-HILL Book Company.*
2. *Woodson, W. E., Tillman, B., & Tillman, P. (1992). Human factors design handbook: information and guidelines for the design of systems, facilities, equipment, and products for human use.*

Subject Code: DS 108 **Course Title:** Representation Techniques

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/2

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Different ways in design ideas can be represented for better visualization. **[07H Lecture,+3H Lab]**
Development of an analytical attitude and ability to deal with complexity of imagination and visualization of object from any angle. **[07H Lecture,+3H Lab]**
Understanding and representing the structure of forms in detail with wireframes.**[07H Lecture,+3H Lab]**
Color representation in the object drawing with section and exploded view**. [07H Lecture,+3H Lab]**

Course Books:

1. *Wood, P., & McDonnell, P. (1994). Scientific illustration: a guide to biological, zoological, and medical rendering techniques, design, printing, and display. John Wiley & Sons.*
2. *Buxton, B. (2010). Sketching user experiences: getting the design right and the right design: getting the design right and the right design. Morgan Kaufmann.*
3. *Powell, D. (1990). Presentation techniques. New York: Little, Brown & Company.*

Reference Books:

1. *Tal, D. (2010). Google Sketch up for site design: a guide to modelling site plans, terrain and architecture. John Wiley & Sons.*
2. *Zeman, N. B. (2014). Essential Skills for 3D Modelling, Rendering, and Animation. CRC Press.*

Subject Code: DS 109 **Course Title:** Software Skills

Contact Hours: L-0 **T** -0 **P**-3

Credit: 2 **Course type:** Professional **Program/Semester:**B.Des/2

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Software skills related to communication design, specially related to some specific softwares used in visual prototyping, film making, creating special effects.

Course Books:

1. *Macario, J. (2008), Graphic Design Essentials: Skills, Software and Creative Solutions, Pearson Publications.*
2. *Henry, K. (2012), Drawing for Product Designers (Portfolio Skills), Laurence King Publishing.*

Reference Books:

1. *Eissen, K. (2014), Sketching: Product Design Presentation. BIS Publishers, B.V.*

Subject Code: DS 110 **Course Title:** Design Project 1

Contact Hours: L-0 **T** -0 **P**-6

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/2

Pre-requisites: Nil

Evaluation scheme: Minor project (20%), Major project (30%), Weekly assignment (50%)

Detail of courses:

Take a simple product of everyday use like electric kettle, electric iron, and toaster. Analyze its design in detail from different design perspective including its visual design aspects. Modify it and come up with a new modified product. You need to select an existing product, identify the design challenges, form and aesthetics and redesign a new product.

Semester - III
B- Des

Subject Code: DS 211 **Course Title:** Design Arts and Aesthetics

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/3

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Origin of aesthetic and generate the value system, major contribution of aesthetic in art and design. **[07H Lecture,+3H Lab]**

Social and intellectual development through art. **[07H Lecture,+3H Lab]**

Development of different styles in creative and expressive field of human emotions**[07H Lecture,+3H Lab]**

Design history of Bauhaus, Ulm school, Scandinavian design, Design and Art in post-modernism period, Holistic contribution of Indian art and design. **[07H Lecture,+3H Lab]**

Course Books:

1. *Bergson, H. (1983). Creative evolution. University Press of America.*
2. *Sparke, P. (2013). An introduction to design and culture: 1900 to the present. Routledge.*
3. *H. Kumar Vyas (2007) "Design the International Movement with Indian Parallel".)*

Reference Books:

1. *Robert Bone (2002) "Art and Design Fundamentals".*
2. *De Witt H. Parker (2001) "The principle of Aesthetics".*

Subject Code: DS 212 **Course Title:** Studies in Form

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/3

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Simple geometric form, complex forms, nature and form, human figure, space and form, color and form etc.

[07H Lecture,+3H Lab]

To appreciate and articulate the language of form, to sensitize students towards manipulation of forms in 2D and 3D also Form integration and transition. **[07H Lecture,+3H Lab]**

Experiment with different aspect of forms; understand nature and structure of form, basic techniques of Form.

[07H Lecture,+3H Lab]

Manipulation and their applications to generate Forms and Shapes with desirable objects. **[07H Lecture,+3H Lab]**

Course Books:

1. *Hann, M. (2013). Structure and Form in Design: Critical Ideas for Creative Practice. A&C Black.*
2. *Warell, A. (2001). Design Syntactics: A functional approach to visual product form Theory, Models, and Methods. Chalmers University of Technology.*

Reference Books:

1. *Boden, M. A. (2012). Creativity and art: three roads to surprise.*

Subject Code: DS 213 **Course Title:** Design Thinking

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/3

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Design history, how design thinking is different from technical thinking. **[07H Lecture,+3H Lab]**
What is Design Thinking, Styles of Design Thinking**?** **[07H Lecture,+3H Lab]**
Goal Seeking & Setting Research, Understanding Context, Visual Mapping & Resource Mapping, Categories and Trends Compositions and Judgements**. [07H Lecture,+3H Lab]**
Opportunity Mapping and Scenario Visualisation, Communications and Reflection, Presentations with Business Models**.** **[07H Lecture,+3H Lab]**

Course Books:

1. *Rowe, P. G. (1991). Design thinking. MIT press.*
2. *Lockwood, T. (2010). Design thinking: Integrating innovation, customer experience, and brand value. Sky horse Publishing, Inc.*
3. *Plattner, H., Meinel, C., & Leifer, L. (Eds.). (2010). Design thinking: Understand–improve–apply. Springer Science & Business Media.*

Reference Books:

1. *Schneider, J., & Stickdorn, M. (2011). This is service design thinking: basics, tools, cases. Wiley.*

Subject Code: DS 214 **Course Title:** Industrial Design 1

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/3

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Simple products, product color and aesthetics,	**[07H Lecture,+3H Lab]**
Simple products, Design from consumers point of view, product language**,**	**[07H Lecture,+3H Lab]**
Aesthetic aspect, functionality, product semantic, meaning of sign and symbol, product analysis, product form and psychology**.**	**[07H Lecture,+3H Lab]**
White goods, medical products, complex products etc.	**[07H Lecture,+3H Lab]**

Course Books:

1. *Heufler, G. (2004). Design basics. NiggliVerlag.*
2. *Bramston, D. (2010). Basics Product Design 03: Visual Conversations (Vol. 3). AVA Publishing.*
3. *Bramston, D. (2008). Basics Product Design 01: Idea Searching (Vol. 1). AVA Publishing.*

Reference Books:

1. *Cuffaro, D&Zaksenberg, I (2013) The Industrial Design Reference & Specification Book.*

Subject Code: DS 215 **Course Title:** Communication Design 1

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/3

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Communication basics, semiotics, semantics, and typography and: Introduction to Communication Design.

[07H Lecture,+3H Lab]

Effective Communication, Human Perception, Aesthetics, Emotion and Subjectivity, Visual Perception and Cognition: Human Eye, Optical Illusion, Color Perception, Depth Perception, Motion Perception.

[07H Lecture,+3H Lab]

Visual Language: Semiotics - Semantics, Syntactic, Pragmatics, Sign - Design of Icon, Index, Symbol and Logo. Visual Hierarchy: Visual Focal, Visual Order, Eye Movement, Visual Flow and Continuity, Visual Composition.

[07H Lecture,+3H Lab]

Information Design: Information Chunking, Grids, Visual Abstraction of Quantitative information, Application of Gestalt Laws of grouping, Information Graphics**.** **[07H Lecture,+3H Lab]**

Course Books:

1. *Malamed, C. (2011). Visual language for designers: principles for creating graphics that people understand. Rockport Pub.*
2. *Arnheim, R. (1969). Visual thinking. Univ of California Press.*
3. *Bertin, J. (1981). Graphics and graphic information processing. Walter de Gruyter.*
4. *Barry, A. M. (1997). Visual intelligence: Perception, image, and manipulation in visual communication. SUNY Press.*

Reference Books:

1. *Meirelles, I. (2013). Design for information: an introduction to the histories, theories, and best practices behind effective information visualizations. Rockport publishers.*
2. *Krum, R. (2013). Cool infographics: Effective communication with data visualization and design. John Wiley & Sons.*

Subject Code: DS 216 **Course Title**: Design Project 2

Contact Hours: L-0 **T** -0 **P**-6

Credit: 4 **Course type**: Professional **Program/Semester**:B.Des/3

Pre-requisites: Nil

Evaluation scheme: Minor project (20%), Major project (30%), Weekly assignment (50%)

Detail of courses:

Take a product which operates in a space like washing machine, microwave oven etc. Analyze the product from product and visual design perspective using formal design procedure and come up with a redesigned product. You need to work upon the visual elements of the product as well.

Semester - IV
B- Des

Subject Code: DS 217 **Course Title:** Design Research Including using Study

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/4

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Qualitative and qualitative research methodology, [**07H Lecture,+3H Lab]**
Questionnaire design, validation, repeatability testing, psychophysical scales**, [07H Lecture,+3H Lab]**
Direct observation and activity analysis, photography as a tool in design research etc**[07H Lecture,+3H Lab]**
Persona, scenario, story boarding. **[07H Lecture,+3H Lab]**

Course Books:

1. *Laurel, B. (2003). Design research: Methods and perspectives. MIT press.*
2. *Koskinen, I., Zimmerman, J., Binder, T., Redstrom, J., & Wensveen, S. (2011). Design research through practice: From the lab, field, and showroom. Elsevier.*
3. *Creswell, J. W., & Clark, V. L. P. (2007). Designing and conducting mixed methods research.*

Reference Books:

1. *Creswell, J. W. (2013). Research design: Qualitative, quantitative, and mixed methods approaches. Sage publications.*

Subject Code:DS 218 **Course Title:** Packaging Design and Branding

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/4

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), mid term (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Global Packaging Branding and Promotion**.** **[07H Lecture,+3H Lab**]
Digital Image Manipulation Applications. **[07H Lecture,+3H Lab]**
Packaging Research and conceptualisation, Packaging Design Approaches and Techniques. **[07H Lecture,+3H Lab]**
Packaging Design Realisation, Packaging Form and Elements. **[07H Lecture,+3H Lab]**

Course Books:

1. *Van Roojen, P., & Hronek, J. (2010). Basic Packaging. Pepin Press.*
2. *Denison, E., & Ren, G. Y. (2001). packaging prototypes 3: Thinking Green (Vol. 3). RotoVision.*
3. *Pecht, M. (1991). Handbook of electronic package design (Vol. 76). CRC Press.*

Reference Books:

1. *Bringhurst, R. (1992). The elements of typographic style (Vol. 127). Point Roberts: Hartley & Marks.*

Subject Code:DS 219 **Course Title:** Materials and Processes

Contact Hours:L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/4

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Importance of Material in Design, Conventional Materials in Design.	[**07H Lecture,+3H Lab]**
Material Science and Material Affordance in Product Design**.**	**[07H Lecture,+3H Lab]**
Manufacturing of Materials; Material Formation; Shaping and Joining**.**	**[07H Lecture,+3H Lab]**
Emerging Materials; Sustainable Materials and Processes; Material Experience in Design	**[07H Lecture,+3H**

Course Books:

1. *Ashby, M. F., & Johnson, K. (2013). Materials and design: the art and science of material selection in product design. Butterworth-Heinemann.*
2. *Lefteri, C. (2007). Making it: Manufacturing techniques for product design. Laurence King.*

Reference Books:

1. *Ulrich, K. T. (2003). Product design and development. Tata McGraw-Hill Education*.

Subject Code: DS 220 **Course Title:** Industrial Design 2

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/4

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Complex products, design as a strategic tool, design and innovation, design process, user study, need identification.

[07H Lecture,+3H Lab]

Sigma analysis of user and product activity, usability, material analysis, visual analysis, factor analysis. **[07H Lecture,+3H Lab]**

Physiology analysis, technical analysis, environmental analysis, economic analysis, ideation, analogies, selection of an idea, detail design**,** **[07H Lecture,+3H Lab]**

Design for culture, design for manufacture, design for assembly, product rendering, mock-up and prototype, final manufacture**.** **[07H Lecture,+3H Lab]**

Course Books:

1. *Cross, N. (2008). Engineering design methods: strategies for product design. John Wiley & Sons.*
2. *Whitten, J. L., Barlow, V. M., & Bentley, L. (1997). Systems analysis and design methods. McGraw-Hill Professional.*
3. *Cuffaro, D., & Zaksenberg, I. (2013). The Industrial Design Reference & Specification Book: Everything Industrial Designers Need to Know Every Day. Rockport Publishers.*

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Reference Books:

1. *Krippendorff, K. (2005). The semantic turn: A new foundation for design. crc Press.*

Subject Code: DS 221 **Course Title:** Communication Design 2

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/4

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Introduction to Print Media: Forms of Printing, History and Evolution Interrelation of Print and Digital Technologies, Applications. Introduction to Typography**:** **[07H Lecture,+3H Lab]**

History and Evolution, Classification, Anatomy, Legibility Readability, Wordmark Design, Type Design Principles, Techniques and Applications. **[07H Lecture,+3H Lab]**

Introduction to Photography: History and Evolution, Camera Principles, Techniques and Applications. Introduction to Moving pictures: History and Evolution of Cinema, Video and Animation; Principles Techniques and Applications. Visual Identity Design**:** **[07H Lecture,+3H Lab]**

Introduction to Identity Design, Branding and Rebranding; Applications in - Stationary Design, Template Design, Souvenir Design, Signage Design and Web Design. Introduction to Human Computer Interface: Graphic User Interface, Characteristics, Principles and Applications**.** **[07H Lecture,+3H Lab]**

Course Books:

1. *Kipphan, H. (2001). Handbook of print media: technologies and production methods. Springer Science & Business Media.*
2. *Kernan, A. B. (1987). Printing Technology, Letters, & Samuel Johnson. Princeton University Press.*
3. *McLean, R. (1988). The Thames and Hudson manual of typography*.

Reference Books:

1. *Craig, J. (1990). Basic Typography: a design manual. Watson-Guptill Publications.*

Subject Code: DS 222 **Course Title:** Design Project 3

Contact Hours: L-0 **T** -0 **P**-6

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/4

Pre-requisites: Nil

Evaluation scheme: Minor project (20%), Major project (30%), Weekly assignment (50%)

Detail of courses:

Sample project: Students for the first time bifurcate into their area of interest in the areas of product and communication design. Product Design: Space Design e.g. Select a moving space like driver cabin of a locomotive, back hoe loader, tractor etc. Analyze the space and redesign the same from a design perspective. Communication Design: Select a pesticide packaging. Study the context in which it is used and redesign it from a design perspective for the local context.

Semester - V
B- Des

Subject Code: DS 302 **Course Title:** Engineering Design

Contact Hours: L-2 **T** -0 **P**-4

Credit: 5 **Course type:** Professional **Program/Semester:**B.Des/5

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

The course is meant to nurture creativity, innovation and ideas. It is meant to train the students to properly design the product so that the product has the proper finishing and packaging, ready to be launched into the market. The focus of this course is on artefact design (and may be for a few cases on technology design).The course would introduce Engineering Design, its importance, Design Philosophy, Design Paradigm, Design Process, Good Design, Design phases; Need Identification and Problem Definition; Concept Design; Embodiment Design; Materials Selection in design and Selection of Manufacturing Processes; Building and Testing Prototypes; Human Factors Design; and Detail Design. The course would include doing the market survey, identifying need Assessment, motivation, and define objective of the design. This would be followed by concept generation and evaluation, embodiment design and detailed designing of the product with the end output a "functional" model. The end output must be in resonance with the customer requirement that has to be ensured. The course also requires preparation of a product catalogue /brochure presenting the highlights of the product generated.

Course Books:

1. *"Engineering Design", 4th edition by George E. Dieter and Linda C. Schmidt, McGraw Hill, 2008*

Reference Books:

1. *"Engineering Design", 1st edition by Rudolph J. Eggert, Prentice Hall, 2005, ISBN-10: 013143358X | ISBN-13: 9780131433588*
2. *"Fundamentals of Engineering Design", 2nd edition by Barry Hyman, Prentice Hall, 2003, ISBN-10: 013046712X | ISBN-13: 9780130467126*

COMMON COURSE OFFERED BY ME-DISCIPLINE ALONG WITH B.TECH STUDENTS

Subject Code: DS 323 **Course Title**: Service Design

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/5

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Provides insights into the relationships between people, technology (in the broadest sense of the word - paper is a technology) and design. **[07H Lecture,+3H Lab]**

Using cultural and design theories as frameworks it explores through hands-on design projects and case studies the ways in which service design practices creatively engage with new trends in society**. [07H Lecture,+3H Lab]**

The ways in which technologies change society, and the ways in which people (users) shape design practices.

[07H Lecture,+3H Lab]

Reconsider designers and users as the ultimate authors of all new designs, technologies or services.

[07H Lecture,+3H Lab]

Course Books:

1. *Erl, T. (2008). Soa: principles of service design (Vol. 1). Upper Saddle River: Prentice Hall.*
2. *This is service design thinking: Basics, tools, cases. Bis, 2012.*

Reference Books:

1. *Macintyre, M., Parry, G., & Angelis, J. (Eds.). (2011). Service design and delivery. Springer Science & Business Media.*

Subject Code: DS 324 **Course Title:** Sustainable Design

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/5

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Sustainable design principles. **[07H Lecture,+3H Lab]**

Physical, mental, spiritual, cultural, social, ethical and economic issues in designing for sustainability. **[07H Lecture,+3H Lab]**

Ecological footprints, ecosystem impact. Waste, reuse and recycling, benign emissions, green design, integrated DFE/Eco design,
[07H Lecture,+3H Lab]

Design for sustainability, eco innovation, system-wide product/service strategies, sustainable consumption, health, modelling and mapping**.** **[07H Lecture,+3H Lab]**

Course Books:

1. *Williams, D. E. (2007). Sustainable design: Ecology, architecture, and planning. John Wiley & Sons.*
2. *Bhamra, T., &Lofthouse, V. (2007). Design for sustainability: a practical approach. Gower Publishing, Ltd.*

Reference Books:

1. *Vallero, D. A., &Brasier, C. (2008). Sustainable design: the science of sustainability and green engineering. John Wiley & Sons*

Subject Code: 325 a **Course Title:** Applied Ergonomics

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Elective **Program/Semester:**B.Des/5

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Ergonomics in transportation design**,**	**[07H Lecture,+3H Lab]**
Medical equipment design**,**	**[07H Lecture,+3H Lab**]
Ergonomics in toy and game design**.**	**[07H Lecture,+3H Lab]**
Ergonomic principles in developing pleasurable products etc.	**[07H Lecture,+3H Lab]**

Course Books:

1. *Burke, M. J. (1991). Applied ergonomics handbook. CRC Press.*
2. *Karwowski, W., &Marras, W. S. (Eds.). (1998). The occupational ergonomics handbook. Crc Press.*

Reference Books:

1. *Duffy, V. G. (Ed.). (2008). Handbook of digital human modelling: Research for applied ergonomics and human factors engineering. CRC press.*

Subject Code: 325 b **Course Title:** Visual Ergonomics

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Elective **Program/Semester:**B.Des/5

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Visual ergonomic principles**,**	**[07H Lecture,+3H Lab]**
Ergonomics in typography**.**	**[07H Lecture,+3H Lab]**
Ergonomics in cartography.	**[07H Lecture,+3H Lab**
Ergonomics in information design	**[07H Lecture,+3H Lab]**

Course Books:

1. *Anshel, J. (Ed.). (2005). Visual ergonomics handbook. CRC Press.*
2. *Anshel, J. (2002). Visual ergonomics in the workplace. CRC Press.*

Reference Books:

1. *Woodson, W. E., Tillman, B., & Tillman, P. (1992). Human factors design handbook: information and guidelines for the design of systems, facilities, equipment, and products for human use*.

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Subject Code: DS 326 **Course Title:** Design Project 4

Contact Hours: L-0 **T** -0 **P**-6

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/5

Pre-requisites: Nil

Evaluation scheme: Minor project (20%), Major project (30%), Weekly assignment (50%)

Detail of courses:

Sample project: Design a completely new product after identifying the needs of the users. Product Design: Example: Design a kit for self-monitoring of different physiological parameters like heart rate, blood pressure etc. for the elderly staying alone at home and who is illiterate. Communication Design: Example Design an interactive game for rural women which would engage them and raise awareness about child health in India.

Semester - VI

B- Des

Subject Code: DS327 **Course Title:** Interface Design

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/6

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Interface design basics,	**[07H Lecture,+3H Lab]**
Interface and interaction, components	**[07H Lecture,+3H Lab]**
Usability principles.	**[07H Lecture,+3H Lab]**
Application of interface design in product and space.	**[07H Lecture,+3H Lab]**

Course Books:

1. *Tidwell, J. (2010). Designing interfaces. "O'Reilly Media, Inc.".*
2. *Stone, D., Jarrett, C., Woodroffe, M., &Minocha, S. (2005). User interface design and evaluation. Morgan Kaufmann.*

Reference Books:

1. *Baumann, K., & Thomas, B. (2002). User interface design of electronic appliances. CRC Press.*

Subject Code: DS 328 **Course Title:** Design Forecasting and Trend Research

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/6

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Competitor product analysis**,**	**[07H Lecture,+3H Lab]**
Future trends,	**[07H Lecture,+3H Lab]**
Patent Search / Review of IP**,**	**[07H Lecture,+3H Lab]**
International developments study and, new materials and processes review.	**[07H Lecture,+3H Lab]**

Course Books:

1. *Raymond, M. (2010). The trend forecaster's handbook. Laurence King.*
2. *Kahn, K. B. (2010). New-Product Forecasting. John Wiley & Sons, Ltd.*

Reference *Books:*

1. *Mendelsohn, L. B. (2000). Trend forecasting with technical analysis.*

Subject Code: DS 329 **Course Title:** Design Management

Contact Hours: L-3 **T** -0 **P**-1

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/6

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Skills, knowledge and learning style evaluation, personal goal setting and professional development planning.

[07H Lecture,+3H Lab]

Insight into the context that businesses and organisations operate in, how they view and use design, and their relationship with designers. **[07H Lecture,+3H Lab]**

Examine the roles of design and innovation in achieving organisational objectives**[07H Lecture,+3H Lab]**

To bring together the languages of design and business, it considers organisational objectives, how design and innovation deliver value and return on investment is evaluated**.** **[07H Lecture,+3H Lab]**

Course Books:

1. *Best, K. (2006). Design management: managing design strategy, process and implementation. AVA publishing.*
2. *Cooper, R., Junginger, S., & Lockwood, T. (Eds.). (2013). The handbook of design management. A&C Black.*

Reference Books:

1. *Martin, R. L. (2009). The design of business: Why design thinking is the next competitive advantage. Harvard Business Press.*

Subject Code: DS 330 a **Course Title:** Industrial Design (Elective 1)

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Elective **Program/Semester:**B.Des/6

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Industrial design application in furniture design.	**[07H Lecture,+3H Lab]**
Industrial design application in interior and space design.	**[07H Lecture,+3H Lab]**
Industrial design application in transportation design**.**	**[07H Lecture,+3H Lab]**
Industrial design application in display and control design.	**[07H Lecture,+3H Lab]**

Course Books:

1. *Arden, P. (2003). It's not how good you are, it's how good you want to be. Phaidon.*
2. *Hirschberg, J. (1999). The creative priority: Putting innovation to work in your business.*

Reference Books:

1. *Cross, N. (2008). Engineering design methods: strategies for product design. John Wiley & Sons.*

OR

Subject Code: DS 330 b **Course Title:** Communication Design (Elective 1)

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Elective **Program/Semester:**B.Des/6

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Communication design application in furniture design.	**[07H Lecture,+3H Lab]**
Communication design application in interior and space design	**[07H Lecture,+3H Lab]**
Communication design application in transportation design.	[**07H Lecture,+3H Lab]**
Communication design application in display and control design	**[07H Lecture,+3H Lab]**

Course Books:

1. *Williams, R., & Newton, J. (2009). Visual communication: integrating media, art, and science. Routledge.*
2. *Worth, S., & Gross, L. P. (1981). Studying visual communication (pp. 134-147). L. P. Gross (Ed.). Philadelphia: University of Pennsylvania Press.*

Reference Books:

1. *Baldwin, J., & Roberts, L. (2006). Visual communication: from theory to practice. Ava Publishing.*

Subject Code: MN303 **Course Title:** Design Project 5 (Fabrication Project)

Contact Hours: L-0 **T** -0 **P**-0

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/6

Pre-requisites: Nil

Evaluation scheme: Minor project (20%), Major project (30%), Weekly assignment (50%)

Detail of courses:

This is for the first time student start taking projects in their area of interest; product or communication design. This project starts with a small course on technical writing and portfolio design. This is an extension of the Engineering Design course where the students come up with a tangible, fully functional prototype of the concept they have come up with. The students learn to make their own prototype using different materials and tools.

Subject Code: DS 301 **Course Title:** Computer Aided Process and Planning

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/6

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

1. **Introduction to Manufacturing**: Basic taxonomy of manufacturing, types of manufacturing, discrete versus continuous manufacturing, design for manufacturing, material processing, material planning, process planning, Group Technology
2. **Part design and representation**: Engineering Design, Design drafting, Computer-aided design
3. **Introduction to CAD:** CAD architecture, CAD hardware, CAD software, CAD systems example, Fundamentals of Geometrical Modelling and Solid Modelling, CAD/CAM data exchange

[14TH, 14 Pr]

4. **Process Engineering**: Experience-based planning, decision logic, decision table and decision tree, process capability analysis
5. **Process planning:** Introduction, manual process planning, Variant process planning, and Generative process planning.
6. **Computer-aided process planning systems:** Generalized CAPP model, implementation considerations, Examples of process planning systems. **[14 TH, 14 Pr]**

Course Books:

1. *Chang, T. C., &Wysk, R. A. (1984). An introduction to automated process planning systems. Prentice Hall Professional Technical Reference.*
2. *Groover, M. P. (2007). Automation, production systems, and computer-integrated manufacturing. Prentice Hall Press.*

Reference Books:

1. *Chang, T. C., Wysk, R. A., & Wang, H. P. (1991). Computer-aided manufacturing (pp. 486-515). Englewood Cliffs, New Jersey: Prentice Hall.*

Subject Code: HS…. **Course Title:** Environmental Science

Contact Hours: L-3 **T** -0 **P**-0

Credit: 4 **Course type:** Professional **Program/Semester:**B.Des/6

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

COMMON COURSE TO BE OFFERED ALONG WITH B.TECH STUDENTS BY HSS DISCIPLINE

Semester - VII
B- Des

Subject Code: DS 496 **Course Title:** Design Seminar 1

Contact Hours: L-0 **T** -0 **P**-0

Credit: 2 **Course type:** Professional **Program/Semester:**B.Des/7

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

NOT APPLICABLE

Subject Code: DS 498 **Course Title:** Design Thesis 1

Contact Hours: L-0 **T** -0 **P**-0

Credit: 16 **Course type:** Professional **Program/Semester:**B.Des/7

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Students in this semester would take up a technically complex project. Example designing a coffee vending machine, packaging for life saving drugs etc. The students can do design thesis in-house but it would be advisable for them to go to industry/ design firms to do the thesis.

Semester - VIII
B- Des

Subject Code: DS 497 **Course Title:** Design Seminar 2

Contact Hours: L-0 **T** -0 **P**-0

Credit: 2 **Course type:** Professional **Program/Semester:**B.Des/8

Pre-requisites: Nil
Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Students give a seminar in an area in which they want to pursue their thesis

Subject Code: DS 499 **Course Title:** Design Thesis 2

Contact Hours: L-0 **T** -0 **P**-0

Credit: 16 **Course type:** Professional **Program/Semester:**B.Des/8

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

The students would have an option of carrying forward their Design Thesis in Industry for one more semester or to come back to the Institute and do course work in lieu of Design Thesis.

OR

(Course work four electives)

Subject Code: DS 431 a **Course Title:** Industrial Design Elective 2

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Elective **Program/Semester:**B.Des/8

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Industrial design application for physically challenged.	**[14H Lecture,+6H Lab]**
Industrial design application in internal security eg. Counter terrorism etc**.**	**[14H Lecture,+6H Lab]**

Course Books:

1. *Maeda, J. (2006). The Laws of Simplicity (Simplicity: Design, Technology, Business, Life).*
2. *Gershenfeld, N. (2008). Fab: the coming revolution on your desktop--from personal computers to personal fabrication. Basic Books.*

Reference Books:

1. *Cross, N. (2008). Engineering design methods: strategies for product design. John Wiley & Sons.*

Subject Code: DS 431 b **Course Title:** Industrial Design Elective 3

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Elective **Program/Semester:**B.Des/8

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Industrial design application for elderly.	**[L14 Hours, P 6 Hours]**
Industrial design application in sports.	**[L14 Hours, P 6 Hours]**

Course Books:

1. *Cullen, C. D., & Haller, L. (2004). Design Secrets: Product 2. Rockport Publishers.*
2. *Hudson, J. (2008). Process: 50 product designs from concept to manufacture. Laurence King.*

Reference Books:

1. Carstens, D. Y. (1993). *Site planning and design for the elderly: Issues, guidelines, and alternatives*. John Wiley & Sons.

Subject Code: DS 431 c **Course Title:** Industrial Design Elective 4

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Elective **Program/Semester:**B.Des/8

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Industrial design application in medical equipment and hospital design.	**[14H Lecture,+6H Lab]**
Industrial design application for armed forces.	**[14H Lecture,+6H Lab]**

Course Books:

1. *Arden, P. (2003). It's not how good you are, it's how good you want to be. Phaidon.*
2. *Cross, N. (2008). Engineering design methods: strategies for product design. John Wiley & Sons.*

Reference Books:

1. *El Haggar, S. (2010). Sustainable industrial design and waste management: cradle-to-cradle for sustainable development. Academic Press.*

Subject Code: DS 431 d **Course Title:** Industrial Design Elective 5

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Elective **Program/Semester:**B.Des/8

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Industrial design in education: application areas.	**[14H Lecture,6H Lab]**
Industrial design and interactive learning in corporate world.	**[14H Lecture,6H Lab]**

Course Books:

1. *Reinertsen, D. (1997). Managing the design factory. Simon and Schuster.*
2. *Shimizu, Y. (1990). Creative marker techniques in combination with mixed media. Graphic-sha Publishing.*

Reference Books:

1. *Cross, N. (2008). Engineering design methods: strategies for product design. John Wiley & Sons.*

OR

(Course work four electives)

Subject Code: DS 432 a **Course Title:** Communication Design Elective 2

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Elective **Program/Semester:**B.Des/8

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Communication design application for physically challenged. **[14H Lecture,+6H Lab]**
Communication design application in internal security e.g. Counter terrorism etc**. [14H Lecture,+6H Lab]**

Course Books:

1. *Noble, I., &Bestley, R. (2011). Visual research: An introduction to research methodologies in graphic design. A&C Black.*
2. *Rose, G. (2012). Visual methodologies: An introduction to researching with visual materials. Sage.*

Reference Books:

1. *Kipphan, H. (2001). Handbook of print media: technologies and production methods. Springer Science & Business Media.*

Subject Code: DS 432 b **Course Title:** Communication Design Elective 3

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Elective **Program/Semester:**B.Des/8

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Communication design application for elderly.	[L14 Hours, P 6 Hours]
Communication design application in sports.	[L14 Hours, P 6 Hours]

Course Books:

1. *Love, L. D. A Guide to Creating Iconic Brand Identities.*
2. *Lauer, D., &Pentak, S. (2011). Design basics. Cengage Learning.*

Reference Books:

1. *Mandel, T. (1997). The elements of user interface design (Vol. 20). New York: Wiley.*

Subject Code: DS 432 c **Course Title:** Communication Elective 4

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Elective **Program/Semester:**B.Des/8

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Communication design application in medical equipment and hospital design.	**[14H Lecture,+6H Lab]**
Communication design application for armed forces.	**[14H Lecture,6H Lab]**

Course Books:

1. *Resnick, E. (2003). Design for communication: Conceptual graphic design basics. John Wiley & Sons.*
2. *Berryman, G. (1984). Notes on graphic design and visual communication. W. Kaufmann.*

Reference Books:

1. *Love, L. D. A Guide to Creating Iconic Brand Identities.*

Subject Code: DS 432d **Course Title:** Communication Elective 5

Contact Hours: L-2 **T** -0 **P**-2

Credit: 4 **Course type:** Elective **Program/Semester:**B.Des/8

Pre-requisites: Nil

Evaluation scheme: Assignment 1 (15%), Midterm (30%), Assignment 2 (15%), End term (40%)

Detail of courses:

Communication design in education: application areas.	**[14H Lecture,6H Lab]**
Communication design and interactive learning in corporate world**.**	**[14H Lecture,6H Lab]**

Course Books:

1. *"Signs and Symbols: Their Design and Meaning (Paperback)" by Adrian Frutiger, Andrew Bluhm (Translator)*
2. *"The Art of Looking Sideways "by Alan Fletche*

Reference Books:

1. *Graham, Lisa. "Basics of design: Layout & Typography for beginners". Cengage Learning, 2005.*
2. *Williams, Richard. "The Animator's Survival Kit: A Manual of Methods, Principles and Formulas." (2001).*