Course Code: 2 ID4 **Interior Design I** Credits: 6Hours: 6

Learning outcomes:

1. Ideate functional spaces as an outcome of spatial explorations
2. Learn the application of anthropometry in space design for various day to day activities.
3. Make efficient layouts as a resultant of anthropometric studies
4. Draw activities that correspond to universal space design.
5. Communicate through Design Narrative and Concept Note

Teaching Learning Methodology:

The course highlights design as a process and thus the studio curriculum is supported by practical hands-on approaches based on the application of various spaces and activities through mapping techniques. The pedagogy also integrates this subject with other courses taught in the previous and concurrent semesters.

Course Contents:

**UNIT I- Space, Form & Structure:**

Interdependence of form, structure, function and space. Study of simple structural systems and materials, Textures, Colours, Light in space design.

**UNIT II- Interior Concept:**

Various sources of inspiration for design. Types of concepts. Concept as a response to site and context. Design determinants: height of space; spatial transitions- openings within wall planes, doorways, windows, stairways.

**UNIT III- Circulation & Space:**

Types of circulation such as internal, external. Elements of circulation. Types of space such as public, semipublic, private, served & servant spaces, etc.

**UNIT IV: Form composition**:

Relationship of plan, Elevation and section, organization of form, composition of built form. Basic study of Ergonomics; visual analysis of designed spaces for comfort.

**UNIT V- Design:**

Application of anthropometry in design of simple living and working spaces through study of furniture placement and clearances in space. Suggested design projects: Integration of spaces and function in the design of bus shelter, milk booth, watchman’s cabin, flower stall, ATM center, small cafeteria, food trucks etc.

Assessment Scheme:

* Continuous Internal Evaluation: 60%
* External Evaluation: 40%

References :

Refer all course related books, other than text books here

R1: Francis D.K.Ching, “Visual Dictionary of Architecture”, 1995, Van Nostrand Reinhold

R2: Ernst and Peter Neufert, “Architect Data”, 2010, Blackwell Science Ltd.

R3: V.S.Pramar, “Design Fundamentals in Architecture”,1973, Somya Publication Pvt. Ltd.

R4: Lorraine Farrelly, “The fundamentals of Architecture”, 2007, Ava Publications

R5: Fil Hearn “Ideas that shaped buildings”, 2003, The MIT Press Cambridge.

Course Code: **2ID5 Materials & Construction I** Credits: **6** Hours:**6**

Learning outcomes:

1. Gain a comparative knowledge of RCC Construction and material properties and

possible applications in construction and architecture.

1. Comprehend the various metals, their alloys, glass and their varied uses as structural and

non-structural members and associated challenges in the building industry.

1. Identify the scope and limitations of each material and finding appropriate application

in a building envelope.

1. Design various construction details in metal and glass
2. Document and Publish research paper in a journal and a conference

Teaching Learning Methodology:

The course builds a base by developing theoretical knowledge of the materials, including its history, properties, strengths, manufacturing and various market forms. The understanding of application of these materials is explored in detail through lectures, case studies and site visits. Furthermore, material applications and details of structural and non-structural building components are explored. Students also have the opportunity to experience material capacity, their behavior as well as construction methods in demonstrations and site experiments.

Course outcomes:

The students shall be able to:

Course Contents:

**UNIT I- Special Structural Concrete:**

MATERIAL: Basic introduction to special concrete used for structural work ex. reinforced concrete, Fiber reinforced concrete, Light weight concrete, fly ash concrete, High strength-high performance concrete, No-fines concrete, ready mix concrete.

Introduction to theory of reinforcing concrete, Properties and advantage of reinforced concrete, types & grades of steel bars as per BIS specification, Bending and placing of reinforcement in RCC Work.

CONSTRUCTION: Application of RCC in various building elements such as shallow foundation for isolated column, RCC wall, DPC / Plinth & floor / roof beam. One way & two way slab in RCC. Arches & Lintels in RCC. Door, window, frames in RCC. Construction of different types of RCC stairs.

**UNIT II Plastics & Polymer:**

MATERIAL: Brief history of plastics, polymerization of plastics, Classification & Properties of plastics, fabrication of plastic articles, Application of plastics in building services & building construction Geo-synthetics and its classification, Properties & uses of geo-textiles. Natural & synthetic rubber, Uses of rubber in building construction, Vulcanization of rubber.

CONSTRUCTION: Application of PVC & Rubber in various building elements & components, Vinyl, Linoleum & rubber flooring, plastic doors & windows, PVC roofing, Glass fiber reinforced plastic sheets for roofing.

**UNIT III- Iron & Steel:**

MATERIAL: Brief history of Iron, Study of Iron ores its varieties, Manufacturing of Pig-Iron and wrought iron, Properties of iron, composition and Types of cast iron & wrought iron, Properties & uses of cast & wrought iron, types of casting techniques.

Brief history of steel, manufacturing of steel, Properties of Steel, market forms of steel, Mechanical treatment of steel such as hot working & cold working of steel, Heat Treatment of steel.

CONSTRUCTION: Application of iron and steel in various building elements

such as steel grillage foundation, pad foundation, Steel column & beams,

Trusses in steel, North light truss, Monitor Roof, Structural Floor/roof industrial

flooring, Door/Window openings in iron & steel, Metal stair case, Methods of

connecting steel work.

**UNIT IV- Aluminium & their alloys:**

MATERIAL: Brief history of Aluminium, Manufacturing & properties of Aluminium, market forms of aluminium, Uses of Aluminium and Its alloys in building industries.

CONSTRUCTION: Application of aluminium in various building elements such as aluminium door & window, Structural glazing, curtain wall.

**UNIT V- Glass & Glass products:**

MATERIAL: Brief introduction of history of glass, composition of glass, manufacturing & classification of glass, Properties of glass, Types of glasses & their performances, Treatments of glass, Glass industry, Glass as a green building material. Uses of glass in building industry.

CONSTRUCTION: Application of glass in various building elements and components. Glass Floor, wall & partitions systems, Skylight, Glass staircase.

Assessment Scheme:

* Continuous Internal Evaluation: 60%
* External Evaluation: 40%

**References :**

Refer all course related books, other than text books here

R1: S.P.Arora, S.P. Bindra, 2010 “Building Construction Including Engineering Material”. Dhanpat Rai Publications (P) Ltd., New Delhi

R2: Handbook on Concrete Reinforcement and Detailing, SP 34:1987, BIS New Delhi, 2002

R3: CPWD specifications (Vol.1), Director General of Works, New Delhi, 2009

R4: P. Kumar Mehta 1999 “Concrete Technology for Sustainable Development in the twenty-first century”, Cement Manufactures Association, New Delhi

R5: Hegger, Auch-schwelk,Fuchs,Rosenkranz:2006, “Construction material manual”; Birkhauser, Munich.

R6: Schittich, Staib, Balkow, Schuler, Sobek, 2007, Glass Construction Manual, 2nd revised and expanded addition, Birkhauser

R7: Robin Barry, “The construction of buildings (Vol. I-V)”, 2000, Blackwell publishing

R8: Handbook on Building Construction Practices, 1997, SP62:1997, BIS New Delhi

Course Code: **2ID6 Research and Design Process** Credits: **4** Hours: **4**

Learning outcomes:

1. Learn and develop research questions for Design
2. Enhancing observational skills essential to appreciate design
3. Demonstrate inquiries of Design through different print and digital media
4. Demonstrate research explorations through case studies and project activities
5. Communicate Research and Design through Design Narrative and Concept Note

Teaching Learning Methodology:

The subject introduces the constituents of Visual Arts and Basic Design, their principles which are understood through sequential assignments involving two and three dimensional compositions, abstraction, still life studies, rendering techniques, etc.

Course Contents:

**UNIT I- An Introduction to Design**

Exploration of the discipline of design and its multidisciplinary nature; Comprehend users and context; Relevance and value of design and how it impacts society, industry and the environment is established through lectures, case studies and project activities.

**UNIT II- Design and Society**

Explore the inter-relation between the Design and Society; Correlate the Design and Sustainability through lectures, case studies and project activities.

**UNIT III- Design and Industry**

Outreach and co-ordinate between industry for projects and research for innovative products.

**UNIT IV- Design and collaboration**

Take the Design project in a collaborative approach with different stakeholders through lectures, case studies and project activities.

**UNIT V- Innovation by Design**

Demonstrate innovations done by Design through lectures, case studies and project activities.

Assessment Scheme:

* Continuous Internal Evaluation: 60%
* External Evaluation: 40%

**References:**

Refer all course related books, other than text books here

R1: Ansell, C & Torfing J (eds) (2014). Public Innovation through Collaboration and Design. London and New York: Routledge.

R2: Antonneli, Paola (2005). Humble Masterpieces: everyday marvels of Design. Harper Collins Publishers.

R3: Baxter, Mike (1995). Product Design. London Glasgow New York: Chapman & Hall.

R4: Brown, Dan M (2013). Designing Together. New Riders.

R5: Doordan, Dennis (ed) (2000). Design History: An Anthology. Cambridge, London: MIT Press.

R6: Heskett, John (2002). Design: a very short introduction. Oxford University Press.

R7: Geist, Valerius (1978). Life Strategies, Human Evolution, Environmental Design: towards a biological theory of health . New York, Heidelberg, Berlin: Springer-Verag Lawson, Brian (2006).

R8: How Designer’s Think: The design process demystified. Routledge.

R9: Highmore, Ben (ed) (1975). The Design Culture Reader. London and New York: Routledge.

R10: Kepes, Gyorgy (ed) (1966). The Man-Made Object. Studio Vista London.

R11: Norman, Don (2013). The Design of Everyday Things. Hachette UK.

R12: Papanek, Victor J (1984). Design for the Real World: Human Ecology and Social Change. Academy Chicago.

R13: Essi Salonen Designing Collaboration Link

R14: Gupta, Anil K, Grassroots Innovation: Minds On The Margin Are Not Marginal Minds Link

R15: Brown Tim, Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation Link

R16: D’Source, IDC, IITBombay: http://www.dsource.in/

Course Code: **2ID7** **Workshop II** Credits: 4Hours: 4

Learning outcomes:

1ID7.1. Interpret their thoughts and ideas in physical models using CNC, Laser cutting and 3D Printers

1ID7.2. Gain the required knowledge about the application of various digital tools and softwares

1ID7.3. Combine the skills of 3D modelling to express and document the entire design process

1ID7.4. Analyze various parameters i.e. structure, light, ventilation and aesthetics through model

1ID7.5. Write Design Narrative and Concept Note

Teaching Learning Methodology:

The methodology adopted in workshop includes interactive lectures specific to different materials and mediums of model-making. The students are demonstrated various model-making techniques, knowledge about properties of a forementioned materials and their application along with the usage of associated tools and equipment.

Course Contents:

**UNIT I- Model Making:**

(a) Surface Modelling: Complex 2D modeling using CNC Machine, Laser Cutting and 3D printers

(b) Form Modelling: Complex 3D modeling using CNC Machine, Laser Cutting and 3D printers

**UNIT II- Model Making (Advance):**

Study of complex figures to achieve complexity in model making, with addition & subtraction in basic geometry by using natural and industrial timber etc.

**UNIT III- Videography:**

About the Types of Video Camera, accessories, lenses, films their usages, setting of Video camera, aperture, & Shutter speed settings, compositions with respect to view finder, E.V. value colour, white balance, I.S.O. & Exposure.

**UNIT IV- Advance Carpentry & Metal Workshop**:

Types of joint in wood such as butt, dovetails, rebate, tongue and groove etc. how to cut and weld the metal, molding, bolting, usages of fabrication in interior design.

**UNIT V- Modeling & Casting Techniques:**

Volumetric study using 3D printers, CNC and Laser cutting machines

Assessment Scheme:

* Continuous Internal Evaluation: 60%
* External Evaluation: 40%

References:

Refer all course related books, other than text books here

R1: Donald Stoltenberg, “The Artist & Built Environment”, 1980, Davis Publication

R2: Keith Critchlow, “ Order in Space”, 2000, Thames & Hudson

R3: R.C.Gupta, ”Basic Shop Theory carpentry”, Dhanpat Rai publications

R4: Edword Luice Smith, Paul J Karlstroam,” Fletcher Benton”,1990, Harry N Abrams publications, First Edition

R5: Robert J. Lang, “Origami animals”, 1992, Crescent Books Publishers