

# Fundamentals of Digital Tools

## Aim

The objective of this module is to provide the students with knowledge and skills to understand and use basic graphic software in order to create and edit images and layouts. The process of learning will demand the use of appropriate software available in the working market such as Adobe Photoshop, Adobe Illustrator and Sketch Up (or equivalent). The emphasis will be to develop skills to produce interior presentation layout.

## Expected Learning Outcomes

At the end of the course, the student is expected to be able to:

1. Demonstrate knowledge of basic graphic software to be used as tools for making design presentations as well as the basic of digital imaging.
2. Develop digital images in different formats such as JPG, TIFF, BMP, AI and GIF.
3. Use of graphics & image editing software – Adobe.
4. Compose visual presentation layout using essential design principles.
5. Recognize tool or software packages applicable for a specific situation or need.
6. Design basic 3D room with furniture layout and material representation using Sketch-up software.
7. Apply the hierarchy of text, font and style.

## Learning and Teaching Strategy

The module is delivered via face-to-face mode, supplemented by assigned readings before and after classes where appropriate and necessary.

## Course Content

### Unit I: Introduction to Photoshop and user interface

Introduction to the software, Vector vs. bitmap graphics, Image resolution, User interface and basic settings and opening a new file in the software using Open and/or using Place and Import Tools.

Use of primary tools like Crop, Clone Stamp, Paint Bucket, Pen, etc. Use of layers, styles and swatches.

Use of editing tools like rotate, move, copy, scale, skew, distort, etc. Use of filters for additional effects.

### Unit II: Photoshop Techniques and Effects

Working with external files, sizing, correcting & enhancing images

Intermediate level layers, Type formatting, Effects, Retouching images

Painting of Furniture, Floor Plan and Elevation, Perspective Editing

Setting of print paper sizes, resolutions, orientations, etc.

Preparing high-resolution presentation drawings of 2D and 3D work produced in other software.

### Unit III: Introduction to Illustrator and user interface

Understand the fundamentals of CMYK and RGB colors

Setting up the artboard, Creating a background shape, Combining shapes, Sampling a color, Applying a fill and stroke, Applying color and effects, Aligning and distributing shapes, Adding text, Distorting a Shape, importing an image, working with color, color books and custom colors.

### Unit IV: Typography & Illustrations

Setting up the artboard, creating a background shape, Using symbols, Effects & transparency, Exporting & saving files, Advanced blending techniques

### Unit V: Introduction to Sketch up and user interface

Introduction to the software and user Interface.

Templates, toolbars, Model settings, Basics of the drawing tools, organize the model with layers & scenes

### **Unit VI: Creating 3D Space**

Create different parts of an interior space, including the ceiling, staircase, doors and windows, fireplace and kitchen. Add furniture and model the furniture from a photograph, furniture layout, material application and rendering

### **Suggested Assessment Scheme**

Assessment 1: Graphic Presentation for Interior Space (Adobe Photoshop) 30%

Assessment 2: Creating a Self-Promotional Material (Adobe Illustrator) 30%

Assessment 3: Sketch-up project 40%

### **References**

#### Required Texts

Jenkins, S. (2009) *How to do everything: Adobe Illustrator CS4*. McGraw Hill Companies.

Perkins, C. (2009) *How to do everything: Adobe Photoshop CS4*. McGraw-Hill Companies.

Roskes, B. (2009) *Google Sketch Up 7 Hands-On: Basic and Advanced Exercises*. 3DVinci.

#### Reference Texts

Dayle, B. & Dayley, D. (2012) *Adobe Photoshop CS6 Bible*. Wiley.

Gaspar, J. (2011) *Google Sketch Up Pro 8 Step by Step*. VectorPro.

Johnson, S. (2012) *Adobe Illustrator CS6 on Demand Adobe Illustrator CS6: Learn by Video – Master the Fundamentals*. Que Publishing.

Starks, J.L. (2012) *Adobe Photoshop CS6: Complete*

Adode (2018), Adobe Photoshop CC Help

[https://helpx.adobe.com/pdf/photoshop\\_reference.pdf](https://helpx.adobe.com/pdf/photoshop_reference.pdf)

Perkins, C. (2009) *How to do everything: Adobe Photoshop CS4*. McGraw-Hill Companies

Adobe Photoshop CS6 Tutorials.

<http://www.marquette.edu/ctl/e-learning/documents/PhotoshopPDF.pdf>

Dayle, B. & Dayley, D. (2012) *Adobe Photoshop CS6 Bible*. Wiley.

Andrew Faulkner, Conrad Chavez (2015) *Adobe Photoshop CC Classroom in a Book*, the official creator of video training for CorelDraw X4, X5, and X6.

#### Web links

Adode (2018), Adobe Photoshop CC Help

[https://helpx.adobe.com/pdf/photoshop\\_reference.pdf](https://helpx.adobe.com/pdf/photoshop_reference.pdf)

Perkins, C. (2009) *How to do everything: Adobe Photoshop CS4*. McGraw-Hill Companies

Adobe Photoshop CS6 Tutorials.

<http://www.marquette.edu/ctl/e-learning/documents/PhotoshopPDF.pdf>

# Interior Construction Materials

## Aim

The objective of this module provides students with the knowledge and skills to understand the world of interior materials and finishes with reference to the material characteristics & methods of installation. To develop a critical understanding and learning of sustainable design and ecological issues related to materials. Students will learn how to select and use appropriate materials and finishes for different interior spaces such as residential and/or commercial projects.

## Expected Learning Outcomes

At the end of the course, the student is expected to be able to:

- 1) Describe and define the differences in material, quality and maintenance
- 2) Research, select and specify materials from manufacturers
- 3) Demonstrate an understanding of ecological issues related to materials production and disposal
- 4) Create interior material board with specifications and finishes

## Learning and Teaching Strategy

The course is delivered via face-to-face mode, supplemented by assigned readings before and after classes as well as market surveys.

## Course Content

### Unit I: Construction Material- Brick, Stone & Concrete

- Bricks- Types, characteristics, usage and application, joinery, & techniques
- Stone- Types, characteristics, usage and application, joinery, & techniques
- Concrete- Application & techniques
- Market survey of various Brands, Vendors & Suppliers, a comparison in the difference of the pricing.

### Unit II: Wood & Finishes

- Natural Wood: Types, Seasoning, quality, recognize natural wood by their color and texture, finishes
- Engineered Wood: Ply, Block Boards, Particle Board, MDF, HDF & more – characteristics, quality, application & finishes

### Unit III: Glass, Ceramic, Plastic, Metal and other new material

### Unit IV: Surface finishes for roof structure & False Ceiling

- Introduction to materials available for construction of Roof structures – Reinforced Cement Concrete, Stone
- Introduction to all the materials available for construction of false ceiling – Plaster of Paris, Metal (for framing), Wood, Gypsum Boards, Wallpapers, Stones etc
- Industry site visit to understand the working of false ceiling with different materials.
- Market survey of above mentioned materials along with their prices

### Unit IV: Hard Flooring

Stones – Natural stones, Engineered stones  
Mosaic, Terrazzo, Terracotta, Concrete, Cement oxide, Brick

Tiles – Natural stones, Ceramic, Porcelain  
Glass Block Flooring  
Seamless Chemical Flooring

#### **Unit V: Introduction to Sustainable Design**

Production of materials, application and disposal

#### **Unit VI: Advanced materials and its constructions**

- A.C.P – Used as interior material.
- Polycarbonate sheet: - For Parking, courtyard or open to sky covering.
- Corrugated Sheets Panels – Application on a wall/ Panel and Roofs
- Acoustical doors, window, wall treatment
- Hardware Study
- Various Brands/ Vendors/ Suppliers and the price Comparison

#### **Suggested Assessment Scheme**

Assessment 1: Material swatch library	15%
Assessment 2: Material study at Site	15%
Assessment 3: Hand Drafted Sheets compilation	40%
Assessment 4: Research on sustainable materials	15%
Assessment 5: Class Test	15%

# Construction Studies-I

## Aim

The objective of this course is to introduce interior construction details & provide them with the knowledge and skills of conventional detailing. Simple sets of construction drawings with carefully coordinated and interrelated groupings of individual graphic components will be created to develop the basic fundamentals for detailing.

## Expected Learning Outcomes

At the end of the course, the student is expected to be able to:

1. Demonstrate understanding of principles of structures, basic construction techniques and strengths and limitations of materials.
2. Comprehend and coordinate details related to wet areas like toilets and kitchens.
3. Demonstrate the ability to draw and exhibit understanding of different modes of vertical and horizontal circulation.
4. Describe and demonstrate ability to draw basic detailing for partitioning, paneling, framing, etc. using different material and finishes for walls, floors and ceiling.
5. Draw accurate technical drawings with technical nomenclature using adequate drafting conventions.

## Learning and Teaching Strategy

The course is delivered via face-to-face mode; Classes will consist of lectures, studio work critiques, discussions, presentations, field trips, case studies, exercises, project reviews, Individual and team works.

## Course Content

### Unit I: Frame Structure, Load Bearing & Partition Walls

Introduction to frame structure, load bearing walls and study of the basics of different types of Foundation.

Study of Partition Wall Construction using basic building materials like Burnt Bricks, Stone Masonry, CSEB blocks, CMU blocks, Gypsum (Drywall), Glass, Wood, Aluminum and other types.

Study of types of bonds in Brick masonry and types of Stone Masonry techniques.

Study of structural, visual and textural properties of materials and their use in construction work.

### Unit II: Types of Ceiling and Flooring

Introduction to Structural Ceiling, Filler Slabs and their construction techniques. Study of False Ceiling using basic building materials like Wood, Gypsum, Plaster of Paris, Glass and other types.

Flooring using basic building materials like Concrete or Cement, Stone, Brick, Timber, Glass, and other types. Introduction to Types of floors-Raised Floors, Floating Floors, suspended floors, sprung floors, Resin Flooring

Study of structural, visual and textural properties of materials and their use in construction work.

Floors- Construction, Insulation , Damp Proofing, Floor Defects

### Unit III: Doors and Windows with Lintels and Arches

Study of different Types of Doors and Windows from the operational and functional aspect, their standard sizes and technical terminologies. Study of Lintels and types of Arches used in interior works.

### Unit IV: Vertical and Horizontal Circulation

Study of Vertical and Horizontal Circulation using different types of Staircases, Ramps, Elevators and Escalators. Study of basic terminologies of different parts of staircases, types of staircases like Straight Flight, Dog legged, Quarter turn, Bifurcated, Curved and Spiral Staircases.

## **Unit V: Junctions, Joineries and Detailing of Wet Areas**

Study of junctions and joineries in various interior materials. Drawing of Basic Details using different materials. Designing of Wet Areas (Washrooms/Kitchen) with enlarged details.  
Methods of Fastening; Welding, braizing, gluing & pasting.

### **Suggested Assessment Scheme**

Assessment 1: Research booklet on wall, floor, ceiling, windows, doors	25%
Assessment 2: Technical drawings of ceiling, flooring, staircases and ramps	25%
Assessment 3: Technical drawings of doors, windows, arches	20%
Assessment4: Drawings of joineries for different materials	15%
Assessment 5: Class Test	15%

### **References**

#### **Required Texts**

Ching, F.D.K. (2011) Building Construction Illustrated. (4th ed.) John Wiley & Sons.  
Building Construction by J.K.McKay

Panero, J. & Zelnick, M. (2001) Time-Saver Standards for Interior Design and Space Planning, McGraw- Hill Inc.

#### **Reference Texts**

Panero, J & Zelnick, M. (1979) Human Dimension & Interior Space. Whitney Library of Design.

Pile, J.F. & Friedmann, A. (2007) Interior Design. Pearson Prentice Hall

Ramsey, C.G. & Sleeper, H.R. (2011) Architectural Graphic Standards. (Student ed.) John Wiley & Sons.

Wakita, O.A., Linde, R.M. & Bakhoun, N.R. (2011) The Professional Practice of Architectural Working Drawing. (4th ed.) John Wiley & Sons.

#### **Web Links**

# Digital Tools - II

## Aim

The objective of this course is to impart skills on drafting technical drawings on different 2D software (AUTOCAD, REVIT, and any other). The students will develop the correct skills to express their design ideas and technical knowledge to create a drawing file using the software. The knowledge and skills attained in this course will help them create professional technical drawings.

## Expected Learning Outcomes

At the end of the course, the student is expected to be able to:

1. Manipulate Line weights, Linewidths and Layers to produce high quality digital drawings.
2. Drafting of Technical Drawings on required Graphic Scales.
3. 2D representations of 3D objects in plan, elevations and sections.
4. Awareness of architectural drafting with a focus on industry standards.

## Learning and Teaching Strategy

The course is delivered via face-to-face mode in well-equipped computer labs; Classes will consist of lectures, demonstrations, exercises and tutorials.

## Course Content

### Unit I: Introduction to CAD/similar software and user interface

Introduction to the basic of software.

Learning how to open a new file, setting of units, drawing precisions & other drawing aids.

Basic understanding of different toolbars and model-space in CAD.

Use of Layers, line weights, line types, and their properties and their use in drafting.

### Unit II: 2D Drawing & Editing Tools in CAD/ similar software

Study of basic drawing and drafting tools (line, circle, rectangle, polygon, arc, etc.)

Modify Tools - Move, Copy, Rotate, Trim, Scale, Mirror, Fillet, etc.

### Unit III: Advance Tools and Plotting in CAD/ similar software

Setting of Dimension Units, Text height and Text Style, Hatch style.

Study of Templates and Design Centre, Blocks, drafting symbols, Attributes

Study of Plotting techniques and Sheet Composition- setting of ISO Paper Sizes, paper-space, setting

up plotter, Technical Drawing Annotations, converting DWG to PDF and JPEG.

### Unit IV: 3D Drawing and Editing Tools

Introduction to the software and user Interface. Exporting of 2D Drawing into 3D software.

Study of Draw Tools (Line, Rectangle, Circle, Arc, Measurements); Orbit, pan, zoom; Move, Copy, Rotate, Offset, Flip

Working with layers, Group and Components.

Application of Materials, Light and Shadow, Scenes for final rendering.

## Suggested Assessment Scheme

Assessment 1: Digital exercises on 2D drawings of furnitures/rooms	15%
Assessment 1: 2D drawings of interior project prepared using digital software	40%
Assessment 2: 3D drawings of interior project prepared using digital software	20%
Assessment 3: Presentation drawings using digital software	25%

## **References**

### **Required Texts**

AutoCAD 2017 Instructor (Including Unique Access Code) – James Leach

Beginning AutoCAD 2016 (Exercise Workbook) – Cheryl R. Shrock

Mitton, M., 2012, Interior Design Visual Presentation: A Guide to graphics, models, and presentation techniques, Wiley & Sons, Inc.

### **Reference Texts**

Beginning AutoCAD 2016 (Exercise Workbook) – Cheryl R. Shrock

Abbott, D. (2007) *AutoCAD Secrets Every User Should Know*. John Wiley & Son

Porter T. 1994. Design Drawing Techniques for Architects Graphic Designers and Artists. Oxford: Architectural Press.

### **Web Links**



# Interior Material and Method II

## Aim

The objective of this course is to introduce interior textiles, paints, wood & other finishes that give character to interior spaces & enhance their décor. Students learn new concepts of using materials with an understanding of textures, finishes and colors of them.

## Expected Learning Outcomes

At the end of the course, the student is expected to be able to:

1. Describe and define the differences in material, quality and maintenance
2. Research, select and specify materials from manufacturers
3. Appraise and explain the different types and components of interior textile
4. Understand traditional and modern style of upholstery and window treatments
5. Understanding new concepts such as creating a featured wall using wallpaper and other paint mediums to create an interesting effect.
6. Create interior material board with technical specifications for residential and/or commercial project with specifications and finishes

## Learning and Teaching Strategy

The course is delivered via face-to-face mode, Classes will consist of lectures, discussions, presentations, field trips, market surveys, case studies, exercises, Individual and team works.

## Course Content

### Unit I: Using Textiles & Soft Furnishings in Interior Spaces

Incorporating Texture  
Incorporating Pattern  
Balancing Colour & Pattern  
Layering

### Unit II: Interior Design Fabrics & Fibres

- Natural fibres used to make fabric are linen, cotton, silk, hemp, jute, wool, horsehair, cashmere, mohair and camelhair.
- Artificial fibres are obtained from different engineered processes or alterations of existing natural fibres. - acetate, rayon, triacetate and modified rayon, acrylic, nylon and polyester.
- Market survey

### Unit III: Upholstery & Tapestry

Sofas, Day Beds, Couches, Stools, Seats, Chairs

### Unit IV: Floor Covering, Installation, Specifications

- Wooden Flooring: Natural Wood – Boards, Parquetry- Wood Polish  
Engineered Wood/Laminates  
Bamboo
- Resilient Flooring: Carpets & Rugs, Cork, Vinyl, Rubber, Linoleum

### Unit V: Window/Doors Dressing -

Curtains & Draperies, Sheers, Valances, Scarfs, Shutters & Blinds, Roller Shades, Roman Shades  
- Applicatory Specification & Hardware Study

#### **Unit IV: Wall Finishes – Paint, Plaster and more**

Types, quality and applications, specifications Market survey

- Painting techniques & finishes- Faux painting techniques – Colour washing, Dry brushing, Crackle effect, Ragging, Sponging, Striae, etc
- Wall Finishes-Exposed cement plaster, Texture, POP, Gypsum Plaster, Marble powder, Glass mosaic, Laminate
- Tile Cladding
- Wood Paneling
- Wall Paper
- Fabric walls,
- Glass walls installation
- Murals/Motifs

#### **Unit VI: Other Furnishings**

Table Linens

Bedding & Bed Spreads

Cushion & Throws

Towels

Lamp Shades

#### **Suggested Assessment Scheme**

Assessment 1: Material swatch library 15%

Assessment 2: Market Surveys 25%

Assessment 3: Documentation & Presentations 15%

Assessment 4: Class Test 15 %

Assessment 5: Material Selection & Technical Specification for Residential Project 30%

#### **References**

##### Required Texts

Ching, F. (2008) *Building Construction Illustrated*. (4th ed.) John Wiley& Sons.

Godsey, L. (2008) *Interior Design: Materials and Specification*. Fairchild Books.

##### Reference Texts

Wilhide, E. (2007) *Surface and Finishes*. Quadrille Publishing.

Wilson, J. (2010) *Classic and Modern Fabrics: The Complete Illustrated Sourcebook*. Thames & Hudson.

Spier, C. (2006) *Big Book of Window Treatments: More Than 1,000 Ways to Dress Up Your Windows*. Oxmoor House.

Dobson, C. (2009) *The Complete Guide to Upholstery: Stuffed with Step-by-Step Techniques for Professional Results*. St. Martin's Griffin.

##### Web Links

# Design Studio I – Residential

## Aim

The objective of this course is to provide the students with knowledge and skills to be able to analyze and develop interior spaces for typical residential projects (100 – 200SQ M). Following the study of abstract fundamentals of space and form in design principles, students will apply these principles for the planning of interior spaces.

## Expected Learning Outcomes

At the end of the course, the student is expected to be able to:

1. Organize data gathering in order to filter and analyze the information to develop a design brief
2. Translate and produce effective space planning for residential projects
3. Demonstrate and apply abstract design principles and develop three-dimensional concept for human use
5. Explore design concepts through sketches and 3D modeling
6. Design a small and a large residential project
7. Produce drawing package to communicate design intentions including a full set of drawings; material & finishes, furniture, mood-board, sketches and perspectives drawings
8. Acquire the skill of professional graphic presentation as a method of communication and presentation skills

## Learning and Teaching Strategy

This course is delivered via lecturing classes, one-to-one design tutorial, supplemented by field trips and design workshops where applicable. Lecturing classes will also consist of slide presentation, design discussion and exercises plus project reviews.

## Course Content

1. Introduction to Residential Design & Lifestyle
2. Housing & its Spaces terminology
3. Research
4. Programming and planning booklet, User Profile
5. Bubble Diagram
6. Zoning, space planning
7. Schematic design – Floor plan, ceiling plan, elevations & sections
8. Material, finishes, furniture

## Suggested Assessment Scheme

Assessment 1: Research Report	15%
Assessment 2: Programming and Planning, Concept	20%
Assessment 3: Schematic Design	25%
Assessment 4: Material, Finishes, & Furniture	25%
Assessment 5: Presentation Drawings	15%

## References

### Required Texts

- Gibbs, J. (2005) *Interior Design*. Laurence King Publishing.
- Ching, F.C.K. (2005) *Interior Design Illustrated*. John Wiley & Sons Inc.
- Ching, F. (2007) *Architecture; Form, Space and Order*. (2<sup>nd</sup> ed.) John Wiley & Sons.
- Preiser, W. & Smith, K.H. (2010) *Universal Design Handbook*. McGraw-Hill Professional.

### Reference Texts

- Laseau, P. (2001) *Graphic Thinking for Architects and Designers*. John Wiley & Sons.
- Mitton, M. (2008) *Interior Design Visual Presentation*. John Wiley & Sons.
- Panero, J. & Zelnik, M. (1989) *Human Dimension and Interior Space*. Watson-Guptill Publications.
- Pile, J.F. & Friedmann, A. (2007) *Interior Design*. Pearson Prentice Hall.
- Reznikoff, S.C. (1986) *Interior Graphic and Design Standards*. Whitney Library of Design.
- Panero, J. & Zelnik, M. (2001) *Time-Saver Standards for Interior Design and Space Planning*. McGraw-Hill.
- Wissinger, J. (1995) *Interior Design Handbook*. H. Holt.
- Johannes, I. (1995) *Design and Form*. Dover Publications. Van Nostrand Reinhold.
- Miller, S.F. (1995) *Design Process: A Primer for Architectural and Interior Design*. Van Nostrand Reinhold.

### Web Links

# Scale Drawing & Drafting

## Aim

The course aims to develop a basic understanding of 2-Dimensional and 3-Dimensional drawings, orthographic projections by hand, understanding of scale and developing a sense of 3D-Visualization through model making.

## Expected Learning Outcomes

At the end of the course, the student is expected to be able to:

1. Develop understanding of basic terminologies and graphical conventions used in interior drawings. To demonstrate skills on using scales & hand drafting tools.
2. Understanding of measurement of existing spaces using different measurement tools and doing basic measured drawings.
3. Develop skill of doing manual freehand sketches, perspectives using different methods.
4. Develop an aesthetical sense of presentation and rendering techniques using different mediums and methods. Assess command over lettering skills used in presenting the work.
5. Demonstrate understanding of space visualization in 3D and sense of scale through model making.

## Learning and Teaching Strategy

The course is delivered via face-to-face mode; Classes will consist of studio work, tutorials, Critiques, presentations, field trips, exercises, project reviews, Individual and team works.

## Course Content

### Unit I: Introduction to Hand-drafting Tools and Basic Drawing Conventions

Introduction to hand drafting tools, how to use them effectively – Parallel Bars/ T-scale, Set Squares, French Curve, Triangular scale, Compass, Pencils, Ruler and other required tools.

Understanding of drawing basic plan, elevation and section of simple objects and spaces.

Use of various scales in interiors and their measuring units- Architectural and Imperial Scales.

Learning of Lettering Skills and Font Styles.

Basic measured drawing of a space using different measurement tools.

### Unit II: Introduction to Spatial Geometry and 2D and 3D Drawings

Types of Solids - Cones, Ellipsoids, Cylinders, Polyhedrons, Tori, etc.

2D Projections - Orthographic

3D Projections – Isometric & Axonometric

### Unit III: Perspective Drawings

One-point perspective

Two-point perspective

### Unit IV: Presentation & Rendering Skills

Study of sheet composition and title block. Introduction to various rendering and hatching techniques through pencils- graphite and charcoal, pens- dot pen, rotring pen, others to develop drawing presentation and rendering skills.

### Unit V: Model Making

Study Basic knowledge and understanding of different materials used for model making.

Learning of cutting, folding and gluing techniques using different materials in model making. Development a scaled model of any design project using the right materials and techniques. Using appropriate model making materials for application of textures and finishes.

## **Suggested Assessment Scheme**

Assessment 1: Objects drawn with Orthographic projections-2D.	15%
Assessment 2: Objects drawn in Isometric and Axonometric Views-3D.	15%
Assessment 3: Perspective Drawings	25%
Assessment 4: Drawing basic Plans and elevations of measured drawing	25%
Assessment 5: Model making Assignment	20%

## **References**

### **Required Texts**

Weston, R. (2004) Plans, sections and elevations: key buildings of the twentieth century. Laurence King Pub.

Montague, J. (2013) Basic Perspective Drawing: A Visual Approach. John Wiley & Sons.

Ching, F.D.K. (2014) Architecture: Form, Space and Order. John Wiley & Sons.

Architectural Working Drawings – Ralph W. Liebing

Ching, F.D.K. (2011) *Architectural Graphics*. John Wiley & Sons.

### **Reference Texts**

Porter T. (1994) Design Drawing Techniques for Architects Graphic Designers and Artists. Oxford: Architectural Press.

Gill, R.W. (1984). Rendering with Pen & Ink. Thames & Hudson

Brehm, M. (2015). *Drawing Perspective: How to See It and How to Apply It*. B.E.S. Publishing Co.

# Spatial Planning and Design

## Aim

The subject aims to impart the students an understanding of elements and principles of space planning and design. The subject also focuses on space design implications on human perception and behaviour. Study of anthropometric data, ergonomics, estimation of optimum space areas and clearances for various activities; development of zoning and bubble diagrams, spatial divisions and circulation paths will be crucial part of the module.

## Expected Learning Outcomes

At the end of the course, the student is expected to be able to:

1. Demonstrate understanding of elements and principles of design in context to aesthetics and proportions in design and art.
2. Ability to understand the relationship of the spaces (built and intangible) with respect to human body, limitations, surrounding, need, behavior, conditioning and responses.
3. Ability to create abstract diagrams, sketches, and models as tools to exhibit the design process and final outcome.

## Learning and Teaching Strategy

The course is delivered via face-to-face mode; Classes will consist of lectures, studio work critiques, discussions, presentations, field trips, case studies, exercises, project reviews, Individual and team works.

## Course Content

### Unit I: Elements of Design

Introduction to the Elements of Design namely - Line, Shape and Form, Space, Size, Texture, Value, and Colour.

### Unit II: Principles of Design

Introduction to the principles of Design namely – Balance, Rhythm, Contrast, Emphasis, Hierarchy, Repetition, Unity, Harmony, Movement and Proportion and Scale. Gestalt Principles.

### Unit III: Proportioning System

Study of visual relationships between the parts of design.  
Golden ratio, Fibonacci numbers, the modular and manufactured sizes.

### Unit IV: Human Factors- Anthropometry & Ergonomics

Study of anthropometric data- international standards and regional standards. Understanding the importance of ergonomics. Relative sizes of objects and their fit with human body proportions.  
Relationship between work, worker & workplace.

### Unit V: Proxemics

Human interactions and zoning – Intimate, personal, social, public spaces  
Inter-relation between the various functional areas.  
Bubble diagramming, Zoning diagramming, Proximity Charts, etc.

## Suggested Assessment Scheme

Assessment 1: Elements of Design and practical applications in design	15%
Assessment 2: Principles of Design and practical applications in design	15%
Assessment 3: Proportioning System exercises	10%

Assessment 4: Human Factors- Anthropometric data and Ergonomics 30%  
Assessment 5: Bubble Diagrams, Zoning diagrams, Proximity charts, etc, 30%

## **References**

### **Required Texts**

Ching, F.D.K. (1975). Architectural graphics. New York: Van Nostrand Reinhold Co.  
Ching, F.D.K. (1979). Architecture, Form, space & order. New York: Van Nostrand Reinhold.  
Ching, F.D.K. (1987). Interior design illustrated. New York: Van Nostrand Reinhold.

### **Reference Texts**

Betty, E. (1999). Drawing on the right side of the brain. New York: Harper Collins.  
Bachelard, G. (1994). The poetics of space. Boston: Beacon Press.  
Neufert, E., Neufert, P. and Kister, J. (2012). Architects' data. Chichester, West Sussex, UK: Wiley-Blackwell