Maulana Abul Kalam Azad University of Technology, WB
(Formerly known as West Bengal University of Technology)
Proposed Syllabus for B.Sc. (Interior Designing)
Effective from academic session 2023-24

Semester-III

Course Name: Building Construction

Mode: Offline **Credits: 5(4L+1T)**
SUB CODE: BID301

Aim of the Course:

- To know the use of local materials for building construction methods & technologies
- To identify, investigate, analyze and provide solution for constructional problems.
- To develop the sense of morality and trustworthiness in the use of materials and other input resources supplied for projects

Course Objectives: To enable the students to:

- Gain understanding of the varied materials, systems and services within the construction and design of buildings and spaces.
- Understand various factors to be kept in mind to ensure sustainability, safety and longevity while designing a building and/or any super structure.
- To become aware of the existing and new trends and availability of construction materials.
- To gain knowledge of traditional and contemporary building materials, techniques & technologies.
- Understand varied structural techniques and the associated terminology. Gain knowledge & understanding of decision making for selection of suitable building materials for various applications and environments.
- To learn to compare the cost of different building materials and make worthy selections

Sl. No.	Course Outcomes	Mapped Modules
CO1	Elements of the building. The student will get an introduction to the typology and areas of a building. Students will also explore the concept of "Whole Building Design" and study about the super structure & sub structure.	M1
CO2	Introduction to basic building materials. Students will study about the basic building materials like stone, bricks, & sand and their application in a building.	M1

CO3	Students will study about the different types of Brick & Stone Masonry and their application in practical use.	M2
CO4	Foundation and Footing Students will study about the types of foundation and footing. And even study about the advantages & disadvantages of the same.	M2
CO5	Arches & Lintels. Students will study about the functions, shape & sizes of arches and lintels. They will study about the different types of arches and lintels and also the different parts of it along with the technical terms.	M3
CO6	English bond and Flemish bond. English bond and Flemish bond are the two most common brick masonry patterns used in wall construction. Students will study about the formation of English & Flemish Bond with the help of sketches.	M3
CO7	Doors & windows and their application in a building Doors & windows are the two major components of a wall. Students will study about the different types of doors and windows and its uses according to the various factors like space, climate, cost, availability, acoustic etc	M4
CO8	Fire Resisting properties of materials. Students will study about the properties of Fire Resistant Building Materials Used in Construction	M4

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Module Number	Content	Total Hours	% of questions	Bloom Level (applicable)	Remarks, if any
THEORY					
M1	-Elements of a Building. -Basic Building Materials.	**15**	**25**	**1,2**	**NA**
M2	-Brick & Stone Masonry. -English Bond & Flemish Bond	**15**	**25**	**1,2,3**	**NA**
M3	- Arches & Lintels. - Foundation & Footing	**15**	**25**	**1,2**	**NA**
M4	-Doors & windows and their application in a building -Fire Resisting properties of materials.	**15**	**25**	**1,2,3**	**NA**
Total Theory		**60**	**100**		
TUTORIAL		**15**			
TOTAL		**75**			

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Detailed Syllabus:

Module 1: Elements of a building Building a structure is a complex process that requires careful planning, design, and construction. Understanding the basic components of building a structure is critical to ensuring that the structure is safe, structurally sound, and meets all the necessary codes and regulations. From the foundation to the exterior and interior finishes, each component plays an essential role in the construction process. Students will Basic building materials Students will learn about Building material used for construction from starting to completion of a building. **Total Hours:15**
Module 2: Brick & Stone masonry Stone & Brick masonry being the ideal building materials for construction, so the students will learn the use of it in the construction process. They will also learn about the important terms used for brick & stone masonry and also the different types of the same focusing on the English & the Flemish bond **Total Hours:15**
Module 3: Arches & Lintels Students will study about the function, types and the purpose of different types of lintels and arches. They will take help of the sketches to understand the different shapes, sizes, span of the arches with its different parts. Foundation & Footing Students will study about the foundation & Footing which are the two major components of any structure. They will learn about the different types of Foundations & Footing and understand the process of the same. **Total Hours:15**
Module 4: Doors & Windows Students will study about the function, use and the different types of doors and windows and its usage according to the space and the function of the area. Focus will be on the sketches of all the types to understand the different parts of the doors and windows. -Fire Resisting properties of materials. Students will study about the Fire resisting properties of common building materials such as stone, brick, timber, cast-iron, glass, steel, concrete etc. which will help them to understand which types of materials to be used where. **Total Hours:15**

Suggested Readings:

1. S.K. Sharma, Construction Engineering & Materials, Khanna Publishing House (AICTE Recommended Textbook)
2. S. C. Sharma & S.V. Deodhar, Construction Engineering and Management, Khanna Publishing House (AICTE Recommended Textbook)
3. Building Construction, Rangwala
4. Arora S P &Bindra S P, Building Construction, DhanpatRai& Sons, New Delhi, 1990.
5. Deshpande R S, Build Your Own Home, Poona Book Corporation, Pune.1985
6. Deshpande R S, Engineering Materials for Diploma Students, Poona Book Corporation, Poona, 1985
7. Deshpande R. S, Modern Ideal Homes for India, Poona Book Corporation, Poona, 1976
8. Mehra. P, Interior Decoration, Hind Pocket Books Ltd., Delhi, 1981

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Course Name: Computer Graphics – AUTOCAD 2D

Mode: Offline **Credits: 5(3L+2P)**
SUB CODE: BID302 & 392

Aim of the Course:

- Using AUTOCAD software we will be creating digital designs of structures.
- It involves the study of the technicalities, applications, and other aspects of computer-aided design to create drawings

Course Objectives: To enable the students to:

- Develop skills in the industry standard AutoCAD software programme for the production of plans and technical drawings in 2 Dimensions.
- Develop design and digital based skills in producing plans which demonstrate design intentions.
- Understand how digital design software is used in the industry for the production of accurate and detailed plans and layouts for interior and architectural drawings
- The focus should be on Inside out planning and Detailing of the interior spaces will be an important part of practical assignment

Sl. No.	Course Outcomes	Mapped Modules
CO1	Introduction about Computer Aided Designing (Essentiality of CAD), Usage of AutoCAD, Product Show Reel, User Interface of AutoCAD	M1
CO2	Understanding Coordinate System, Classification of AutoCAD Coordinate System, Drafting Basic Shape with Dimension	M1
CO3	Working with Architectural Unit System, Drawing & Modifying Simple Architectural Block	M2
CO4	Drafting Plan of Residential / Commercial Building	M6

CO5	Drafting Front & Side Elevation of Residential / Commercial Building	M3
CO6	Making Layout of Different Sectional Views.	M3
CO7	Concept of AutoCAD Plotting. Plotting a Complete Layout	M10
CO8	Designing & Modifying Complex Architectural Block (Doors, Windows Chajja, Sofa, Wardrobe & Wall Unit).Fire Resisting properties of materials.	M4
CO9	Hatching Different Cross Sections & Applying Various Patterns.	M8
CO10	Customizing Different Dimension Styles	M9
CO11	Layout Slide Show	M7

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Module Number	Content	Total Hours	% of questions	Bloom Level (applicable)	Remarks, if any
M1	Introduction about Computer Aided Designing (Essentiality of CAD),	5	10	1,2	NA
M2	Draw commands	5	10	1,2,3	NA
M3	Understanding Coordinate System, Classification of AutoCAD Coordinate System, Drafting Basic Shape with Dimension	5	10	1,2	NA
M4	Working with Architectural Unit System, Drawing & Modifying Simple Architectural Block,	5	10	1,2,3	NA
M5	Drafting Plan of Residential / Commercial Building	5	10	1,2	NA
M6	Drafting Front & Side Elevation of Residential / Commercial Building	5	10	1,2,3	NA
M7	Designing & Modifying Complex Architectural Block (Doors, Windows Chajja, Sofa, Wardrobe & Wall Unit etc..	5	10	1,2	NA
M8	Hatching	5	10	1,2,3	NA
M9	Dimension style	3	10	1,2	NA
M10	Printing & Plotting	2	10	1,2	NA
Total Theory		**45**	**100**		
PRACTICAL		**30**			
TOTAL		**75**			

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Detailed Syllabus:

Module1:
Introduction to AutoCAD

Students will be introduced to AutoCAD software and taught about the technical terms used in it and there definitions along with all the short-cut keys. They will learn about the functions of each command and how to use it. The basic will cover Drawing tools, modifying tools, array, working in layers, line type, line thickness, line type scale, coloring, hatching, block making, annotation, dimensioning AutoCAD 2D Advanced- Viewports, UCS icon, Paper space& model space, sheet layout, micros, customized interface, customized line-type, customized hatch pattern Digitization of hand drafted sheets of previous semester.

Module 2: In this subject, students will learn about the objects used for drawing purposes, such as lines, polylines, constructed lines, polygons, rectangles, circles, arcs, ellipses, etc. These toolbars are used to create 2-dimensional drawings.
Some other parts of the syllabus are:

- Understanding the concept of drawing a toolbar
- Learning about line command, polyline command, and circle command
- Understanding the concept of other commands
- Arc command
- Text and rectangle command

Module 3: In AutoCAD, there are two coordinate systems, i.e., Cartesian and polar. To these coordinate systems, the absolute and relative coordinates of AutoCAD are applicable. Coordinate Systems: Coordinate system is a system where numbers are used to determine the unique position of points and/or other geometric elements. Students will learn about the Cartesian coordinate system. This system is defined with the help of a pair of perpendicular lines, a single unit of length for both axes, and an orientation for each axis. It is also called a rectangular coordinate system and an orthogonal coordinate system.
Some other parts of the syllabus are:

- Developing different designs
- Methods of developing title block
- Setting up attributes
- Set up layers of industry standards
- Development of plans and elevations

Module4: Here are certain basics to ensuring your AutoCAD drawing session is set up correctly. Certain things have to be decided upon upfront like layers, styles, plotting, etc. So, the students will be learning about it. It's also imperative that the students choose their AutoCAD drawing units before starting. So, the students will be taught how to work with units and learn how to modify any architectural blocks.

Module 5: Building Plans are a set of scaled drawings, which show a view from above, the relationships between rooms, spaces and other physical features at one level of a structure. Students will be taught how to draft any plans of a residential/ commercial layout.

Module 6: Students will be taught how to draw elevations/ sections from a given plan. Drawing outline of the elevation by using [xline] to draw the boundary of the elevation, Rotating and relocating the section view A-A' from the inserted image to match the boundary of the elevation. Students
Module 7: Students will be taught how to design and create furniture's. And also how to modify any existing architectural block, edit it and create a new one fulfilling the requirement for that particular drawing.
Module 8: Students will learn about Hatching Different Cross Sections & Applying Various Patterns to it. They will learn the right use of each pattern and their application in AutoCAD.
Module 9: Students will be taught about Customizing Different Dimension Styles like how to create a custom dimension style; It is a collection of dimension texts and controls its appearance. There are mainly four types of dimension styles used in AutoCAD such as linear, radial, ordinate, and angular. They will learn about them. .
Module 10: Students will be taught how to plot their drawings in a particular scale with proper paper size for the purpose of printing or creating a pdf etc.

PRACTICAL

Credit: 2

Total Hours: 30

1. Interface navigation: Command line, menus, and toolbars.
2. Basic drawing commands: Line, Circle, Arc, Rectangle.
3. Object manipulation: Move, Copy, Rotate, Scale.
4. Precision techniques: Object snaps, Grid and Snap settings.
5. Layer management: Organization and properties.
6. Dimensioning: Linear, Aligned, and Radial dimensions.
7. Blocks and Attributes: Reusable elements with dynamic text.
8. Plotting and Printing: Setup and configuration.
9. Advanced tools: Polylines, Splines, Ellipses.
10. Customization and Automation: Tool palettes, Macros, Scripts.
11. Draft a 3BHK plan/elevation/section in AutoCAD.

References

1. Book on Latest Version of Auto CAD
2. Parker, Charles. Understanding Computers Today & Tomorrow. Fort Worth, TX: Dryden Press, 1998.
3. Sabot, Gary. High Performance Computing Problem Solving with Parallel and Vector Architectures. Reading, MA: Addison-Wesley Publishing Company, 1995.
4. Taylor, Dean. Computer-Aided Design. Reading, MA: Addison-Wesley Publishing Company, 1992.
5. Pradeep Jain & A.P. Gautam, Engineering Autocad, Khanna Publishing House, 2017

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SEMESTER 4

Course Name: Colour, Light & Interior Space

Mode: Offline

SUB CODE: BID401 **Credits: 4 (3L+1T)**

Aim of the Course: To enable the students to understand the application of colors and effect of lights in Interior spaces.

Course Objectives: Developing insights into the factors to be considered while planning home lighting and evaluate the illumination available in relation to different activities and plan appropriate lighting.

Sl. No.	Course Outcomes	Mapped Modules
CO1	The student will get an introduction to Color Theory and different color Systems and understand the principles and importance of using colors in interior design.	M1
CO2	The students will understand the principles of design in color.	M2
CO3	The student will get acquainted with the use of principles of design applied to color in interior spaces.	M2
CO4	The students will be introduced to Lighting and its different types along with its application in Interiors.	M3
CO5	The students will be able to learn quantity and quality of Illumination in an interior design space.	M3
CO6	The students will learn Luminance and lighting and its importance in Interior Spaces.	M4
CO7	The student will learn to apply lighting for outdoor living and gardens.	M4

Learning Outcome/ Skills:

By the end of the course, students should be able to:

- Demonstrate proficiency in understanding the effect of Color in Interior spaces.
- Demonstrate proficiency in understanding the effect of Lighting in Interior spaces.
- Apply understanding of Color skills to communicate design ideas effectively.
- Comply with Lighting standards and conventions commonly used in the industry.

Module Number	Content	Total Hours	% of questions	Bloom Level (applicable)	Remarks, if any
THEORY					
M1	Introduction to Color wheel & Color Systems	10	20	1, 2, 3	NA
M2	Principles of design applied to Color	10	20	1, 2, 3	NA
M3	Introduction to Lighting in Interiors	20	30	1, 2, 3	NA
M4	Luminance & Lighting	20	30	1, 2, 3	NA
	TOTAL	60	100		

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Detailed Syllabus

Module 1 - Introduction to Color wheel & Color Systems

Introduction to Color theory and The color wheel

The Prang Color System

- **Hue:** classes of color (primary, binary, intermediate, tertiary, quaternary), neutrals, changing of hues, warm & cool colors, advancing & receding, hues & the seasons.
- **Value:** value of normal colors, tints & shades, changing of values, effects of different values

Intensity: dull and bright colors, complimentary colors, changing of intensity, texture & its influence on intensity & taste

The Munsell Color System

- The color sphere
- Munsell color notation
- Complementary hues in Munsell color system
- Hue, value, chroma
- Colors and emotions

Effect of color on each other

Total Hours: 10

Module 2 - Principles of Design Applied to Colour:

- **Harmony in color: s**tandard color schemes (related & contrasting harmonies), how to use color harmonies, background colors, keyed colors through neutralizing, mixing etc.
- **Balance in colors: b**alancing dull and bright colors, light & dark colors, warm & cool colors, crossing or repetition.

Total Hours: 10

Module 3 - Introduction to Lighting in Interiors:

- The household activities with special reference to light requirement
- Cultural and social aspects of lighting
- Physiology of vision
- Lighting sources: natural lighting and artificial lighting (traditional to modern)
- Light measurements and units of measurement of lighting.

Quantity of Illumination

- Factors affecting the quantity of illumination in a room: room proportion, colour, texture and cleanliness of room surface, lamp lumen, lamp lumen depreciation
- Competition of room index, coefficient of utilization, maintenance factor of luminance
- Planning lighting installation for a given interior space
- Evaluation of illumination at task/work place against the recommended requirements of illuminization for various activities (ISI & IES recommendations)

Quality of Illumination

- Color rendition
- Spatial distribution of light: direct, indirect, diffused

Glare: luminance contrast, luminance uniformity

Total Hours: 20

Module 4 – Luminance & Lighting:

Types of Lighting

- Local & general lighting
- Applied lighting
- Architectural lighting
- Recessed lighting
- Luminous walls & ceiling

Luminance & Lighting

Controls type, selection, care, maintenance and economic use, lamp holders, lighting switches, motion sensors.

Lighting for Outdoor Living & Gardens

Effects of color on Human Behavior

Total Hours: 20

Suggested Readings:

1. Davidson J, *The Complete Home Lighting Book*, Casell, UK, 1997
2. De Chiara Joseph & Callender John, *Time Saver Standards for Architectural Types & Interior Design & Space Planning,* Mc Graw Hill Book Co.
3. Wieltide, Elizabeth, *Lighting*, Ryland, Peters & Small, London
4. Whitehead R, *Home Lighting Ideas Bedrooms & Baths*, Rockport Publishers, Masachusetts
5. Beazley Mitchell, *Colour Book*, Reed Consumer Books Pvt. Ltd.
6. Chijiwa Hideaki, *Colour Harmony*; Rockport Publishers
7. Halse A. O, *The Use of Colour in Interiors*; McGraw Hill Book Company

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Course Name: Computer Graphics - SKETCH UP

Mode: Offline

SUB CODE: BID403 & 493 **Credits: 5 (3L+2P)**

Aim of the Course: To enable the students to understand the application of Google sketch up in Interior spaces.

Course Objectives: Developing Students to master Sketch up for creating detailed 3DModels with a focus on Interior Design.

Sl. No.	Course Outcomes	Mapped Modules
CO1	The student will get an introduction to sketch up interface and tools in interior design.	M1
CO2	The students will understand the use of material application and texturing in interior spaces.	M2
CO3	The students will understand the use of lighting and rendering in interior spaces.	M3
CO4	The students will be introduced to presentation techniques through sketch up in interior spaces.	M4
CO5	The students will be introduced to practical project work through sketch up in interior spaces.	M5

Learning Outcome/ Skills:

By the end of the course, students should be able to:

- Demonstrate proficiency in sketch up interface and tools.
- Demonstrate proficiency in 3D Modeling skills for Interior spaces.
- Apply understanding of material application and texturing for Interior spaces.
- Apply understanding of lighting and rendering techniques for Interior spaces.

Module Number	Content	Total Hours	% of questions	Bloom Level (applicable)	Remarks, if any
THEORY					
M1	Introduction to Sketch up & Tools	10	10	1, 2, 3	NA
M2	Introduction to Material Application & Texturing	15	15	1, 2, 3	NA
M3	Introduction to Lighting & Rendering	15	25	1, 2, 3	NA
M4	Presentation Techniques	5	20	1, 2, 3	NA
M5	Project work	30	30	1, 2, 3	NA
	TOTAL	75	100		

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Detailed Syllabus

Module 1 - Introduction to Sketch Up

Introduction to Sketch up

- Overview of Sketch Up
- Software installation and setup
- Understanding the interface
- Understanding Basic tools

Total Hours: 10

Module 2 – Understanding how to use of the material application for interior spaces

- Material Application in Interior Spaces
- Texturing in Interior Space.

Total Hours: 15

Module 3 – Understanding how to use of the Lighting application for interior spaces

- Lighting Application in Interior Spaces
- Rendering Application in Interior Space.

Total Hours: 15

Module 4 – Understanding presentation techniques for interior spaces

- Exporting files in sketch up.
- Presentation techniques in Sketch up.

Total Hours: 5

Module 5 – Project Work for interior spaces (Prcatical)

- Students will choose a project based in Interior space design.
- Applying learned skills to a comprehensive project

Total Hours: 30

Suggested Readings: Sketch Up: Step By Step Guide To Start Sketch Up by Errin Esquerre

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Course Name: Ergonomics

Mode: Offline **Credits: 4(3L+1T)**

SUB CODE: BID 402

Aim of the Course:

- To identify the scope of human factors, Human compatibility, comfort, and adaptability in design;
- To understand the physical aspect of human factors, anthropometry, occupational stress, and musculoskeletal disorders
- To develop visual communication concerning Environmental factors influencing human performance;

Course Objectives: Enable the students to:

- To understand the definition and history of Human Factors/Ergonomics; Principles of fitting design configurations to the users; and Man-machine-environment interaction system.
- To analyze the physical aspects of human factors: anthropometrics, human body structure and function, posture, joint movement, and biomechanics;
- To focus on safety and health issues; Occupational stress and Musculoskeletal disorders leading to innovative designs.
- To enhance the Cognitive aspects of user-system interaction: perception, information processing, user behavior, error, and risk perception;
- To understand and implement the principles of human factors in visual communication and Environmental factors influencing human performance;

Sl.	Course Outcomes	Mapped Modules
CO1	Students will possess a thorough understanding of ergonomics principles and their practical applications in designing systems, products, and environments that prioritize user satisfaction, safety, and efficiency.	M1
CO2	Students will understand the anthropometrics, human body structure, and function, enabling the analysis and application of ergonomic principles to design products, workspaces, and environments that accommodate diverse human characteristics. The knowledge and skills necessary to address physical aspects of human factors effectively, fostering safe, healthy, and productive work environments.	M2
CO3	Students will understand the anthropometrics, human body structure, and function, enabling the analysis and application of ergonomic principles to design products, workspaces, and environments that accommodate diverse human characteristics. The knowledge and skills necessary to address physical aspects of human factors effectively, fostering safe, healthy, and productive work environments.	M2
CO4	Students will enhance their knowledge and skills to design user-system interactions that are intuitive, efficient, and error-resistant, enhancing user satisfaction and performance while minimizing the potential for errors and risks.	M3
CO5	Students will be proficient in applying human factors principles to design visually effective communication materials that facilitate clear understanding, engagement, and interaction while considering environmental influences and involving end-users in the design process.	M4

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Module Number	Content	Total Hours	% of questions	Bloom Level (applicable)	Remarks, if any
THEORY					
M1	Introduction to Ergonomics:	**15**	**25**	**1,2**	**NA**
M2	Physical aspects of human factors:	**15**	**25**	**1,2,3**	**NA**
M3	Cognitive aspects of user-system interaction:	**15**	**25**	**1,2**	**NA**
M4	Principles of human factors in visual communication	**15**	**25**	**1,2,3**	**NA**
Total Theory		**60**	**100**		
TUTORIAL		**15**			
	TOTAL	**75**			

Detailed Syllabus:

Module 1: Introduction to Ergonomics:

Definition, History, and Scope of Human Factors/Ergonomics; Principles of fitting design configurations to the users; Man-machine-environment interaction system: A design perspective; Human compatibility, comfort, and adaptability;

Students will possess a thorough understanding of ergonomics principles and their practical applications in designing systems, products, and environment.

Total Hours:15

Module 2: Physical aspects of human factors:

Anthropometrics, human body structure and function, posture, joint movement, and biomechanics; Occupational stress and Musculoskeletal disorders; Safety and health issues;

Students will understand the anthropometrics, human body structure, and function, enabling the analysis and application of ergonomic principles to design products, workspaces, and environments that accommodate diverse human characteristics. the knowledge and skills necessary to address physical aspects of human factors effectively, fostering safe, healthy, and productive work environments.

Total Hours:15

Module 3:Cognitive aspects of user-system interaction:

Perception, information processing, user behavior, error, and risk perception;

Students will be equipped with the knowledge and skills to design user-system interactions that are Intuitive, efficient, and error-resistant, enhancing user satisfaction and performance while minimizing the potential for errors and risks.

Total Hours:15

Module 4: Principles of human factors in visual communication;

Visual display in different planes- static shape, size, font type, and dynamic characters of display; Environmental factors influencing human performance; Participatory ergonomics aspect.

Students will be proficient in applying human factors principles to design visually effective communication materials that facilitate clear understanding, engagement, and interaction while considering environmental influences and involving end-users in the design process.

Total Hours:15

Suggested Readings:

1. Bridger, R., Introduction to Ergonomics, 3rd Ed., CRC Press, Taylor & Francis Group, 2009.
2. Sanders, M., McCormick, E., Human Factors in Engineering and Design, 7th Ed., McGraw-Hill International Editions: Psychology Series, 2013
3. Wicknes, C., Gordon, S., Liu, Y., and Gordon-Becker, S., An Introduction to Human Factors Engineering, Longman, New York, 2015
4. Chakrabarti, D., Indian Anthropometric Dimensions for ergonomic design practice, National Institute of Design, Ahmedabad, 1997
5. Salvendy, G. (ed.), Handbook of Human Factors and ergonomics, 4th Ed., John Wiley & Sons, Inc., 2012
6. Dul, J., Weerdmeester, B., Ergonomics for beginners, a quick reference guide, 3rd Ed., CRC Press, Taylor & Francis Group, 2008