SHIVAJI UNIVERSITY, KOLHAPUR
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शिवाजी विद्यापीठ, कोल्हापूर, ४१६ ००४, महाराष्ट्र
दूरध्वनी - इपीबीएक्स - २०६०९०००, अभ्यासमंडळे विभाग : ०२३१- २६०९०९४, २६०९४८७
वेबसाईट : www.unishivaji.ac.in ईमेल : bos@unishivaji.ac.in

Estd. 1962
"A++" Accredited by NAAC (2021)
With CGPA 3.52

Ref.: SU/BOS/ *IDS* / 607 **Date: 06 - 10- 2025**

To,

The Principal,
All Concerned Affiliated Colleges/Institutions
Shivaji University, Kolhapur

Subject : Regarding revised syllabi of **B. Voc. Part I (Sem. I & II)** degree programme under the Faculty of Inter- Disciplinary Studies as per NEP-2020 (2.0).

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the revised syllabi, nature of question paper and equivalence of **B. Voc. Part I (Sem. I & II)** for follower's degree programme under the Faculty of Inter- Disciplinary Studies as per National Education Policy, 2020 (NEP 2.0).

Course
B. Voc. Advanced Diploma In Medical Laboratory Technology Part -1
B. Voc. Building Technology and Interior Design Part -1
B. Voc. Printing & Publishing Part -1
B. Voc. Nutrition and Dietetics Part – I

This syllabus, nature of question and equivalence shall be implemented from the academic year **2025-2026** onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in NEP-2020 (Online Syllabus)

The question papers on the pre-revised syllabi of above-mentioned course will be set for the examinations to be held in October /November 2025 & March/April 2026. These chances are available for repeater students, if any.

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours Faithfully

(Dr. S. M. Kubal)
Dy Registrar

Encl. : As above.

Copy to: For Information and necessary action.

1	The Dean, Faculty of IDS	7	Affiliation T. 1 & T. 2 Section
2	Director, Board of Examination and Evaluation	8	Appointment A & B Section
3	The Chairman, Respective Board of Studies	9	P.G.Seminar Section
4	All On Exam Section	10	I.T. Cell
5	Eligibility Section	11	Internal Quality Assurance Cell (IQAC)
6	P. G. Admission Section		

Shivaji University Kolhapur

Established: 1962

Accredited By NAAC with 'A++' Grade with CGPA 3.52

Revised Syllabus For

Bachelor of Vocation [B. Voc.] (NEP-2.0)

Part-I

Building Technology and Interior Design

UNDER

Faculty of Interdisciplinary Studies Structure, Scheme and

Revised Syllabus

(To be implemented from academic year 2025-26 onwards).

Shivaji University, Kolhapur

NEP-2020 (2.0): Credit Frame work for UG B.Voc. I Programme under Faculty of Under Faculty of Interdisciplinary Studies

B.Voc. I (Building Technology and Interior Design)

Level	Semester	COURSES			OE	VSC/SEC	AEC/VEC/IKS	OJT/FP/CEP/CC/ RP	Total Credit
		Course –I	Course -II	Course -III			IKS		
4.5	I	DSC-I (2) DSC-II (2) DSC Pract. I (2)	DSC-I (2) DSC-II (2) DSC Pract. I (2)	DSC-I (2) DSC-II (2) DSC Pract.I(2)	OE -I (P)(2)		IKS-I (2) Introduction to IKS		
	Credits	4+2=6	4+2=6	4+2=6	2		2		22
	II	DSC-III (2) DSC-IV (2) DSC Pract. II (2)	DSC – III(2) DSC-IV(2) DSC Pract.II(2)	DSC-III(2) DSC-IV(2) DSC Pract.I(2)	OE-II (P)(2)		VEC-I(2) (Democracy, Election and constitution)		
	Credits	4+2=6	4+2=6	4+2=6	2		2		22
1st Year Cum. Credits		8(T)+4(P)= 12	8(T)+4(P)= 12	8(T)+4(P)=12	2+2 =4		2 + 2= 4		44
Exit Option: Award of FY Diploma Certificate with 44 Credits									

Semester I
B. Voc. Building Technology and Interior Design

Sem	Course	Code	Paper No.	Title of Paper
I	I	DSC- I	B.Voc. Paper- I	Basics of Graphics
		DSC- II	B.Voc. Paper- II	Engineering Drawing
		DSC- P- I	B.Voc. Practical –I	Based upon DSC-I and DSC- II
	II	DSC- I	B.Voc. Paper- I	Introduction of Building Materials I
		DSC- II	B.Voc. Paper- II	Introduction of Building Materials II
		DSC- P- I	B.Voc. Practical –II	Based upon DSC-I and DSC -II
	III	DSC- I	B.Voc. Paper- I	Elements of Basic Design
		DSC- II	B.Voc. Paper- II	Process of Basic Interior Design
		DSC- P- I	B.Voc. Practical –III	Based upon DSC – I and DSC - II
	OE -I	Open Elective	Practical (2)	Landscape and Outdoor Design
	IKS	h Knowledge System	Theory (2)	IKS (Generic)

Semester II
B. Voc. Building Technology and Interior Design

Sem.	Course	Code	Paper No.	Title of Paper
II	I	DSC- I	B.Voc. Paper- I	3D Visualization
		DSC- II	B.Voc. Paper- II	Perspective Views
		DSC- P- I	B.Voc. Practical –II	Based upon DSC -I and DSC-II
	II	DSC- I	B.Voc. Paper- I	Concrete Technology
		DSC- II	B.Voc. Paper- II	Construction Technology
		DSC- P- I	B.Voc. Practical –II	Based upon DSC – I and DSC - II
	III	DSC- I	B.Voc. Paper- I	Residential Interior Design I
		DSC- II	B.Voc. Paper-II	Residential Interior Design II
		DSC- P- I	B.Voc. Practical-III	Based upon DSC – I and DSC - II
	OE -II	Open Elective - II	Theory (2)	Auto-Cad
	VEC	Value Education Course	Theory (2)	Democracy, Election and Good Governance

Eligibility for Admission: 10 + 2 from any faculty or equivalent Diploma /Advanced Diploma in any related stream.

Eligibility for Faculty:

1) Post graduate with NET / SET
2) M. A. (English) with NET/SET for Business Communication.
3) B.Arch. / B.E. civil with ten years' experience.

Eligibility for Lab Assistant: Graduation with related field

Staffing Pattern

Teaching: In the 1st year of B. Voc. – One Full Time
One C. H. B. for Business Communication Lab. Assistant:
For 1st Year of B. Voc. – 1 Part Time
For 2nd and 3rd Year (Inclusive of 1st Year) of B. Voc. – 1 Full Time

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B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I(Building Technology and Interior Design) Sem. I (Course - I) DSC– I

B.Voc. Paper I Basics of Graphics Theory: 30 Hours

(Credits: 02)

Unit I : Drafting essentials **(8 hours)**

Introduction of drawing equipment's

Materials of Drafting

Methods of Drafting

Lettering – different styles.

Unit II: Methods of drawing **(7 hours)**

Methods of engineering drawings

Methods of interior drawings

different types of lines used in drawing practice

Projections of planes

Unit III: Concept of Angle method **(8 hours)**

Concept of first angle method

Concept of third angle method

Projections of points on regular reference planes

Projection of oblique lines

Unit IV: Projections of lines & Planes **(7 hours)**

Projections of lines: Projections of points on regular reference planes.

Projections of horizontal, frontal and Profile lines on regular and auxiliary reference planes.

Projections of planes

Projections on regular and on auxiliary reference planes.

Reference Books:

1. Engineering Drawingby N. D. Bhatt, Charotor Publication House, Bombay
2. Fundamentals of Engineering by W. J. Luzadder, Drawing, Prentice Hall of India.
3. Engineering Design and Visualization by Jon M.Duff,William A. Ross, CENGAGE Learning
4. Machine Drawing by N. D. Bhatt, Charotor Publication House, Bombay.
5. Graphic Science by French and Vierck, Mc-Graw Hill International.
6. Engineering Drawing and Graphics by K. Venugopal, New Age Publication
7. A text book of Engineering Drawing by R. K. Dhawan, S. Chand and Co.
8. Machine Drawing by K. L. Narayana, New Age Publication
9. Engineering Drawing by N. B. Shaha and B. C. Rana, Pearson Education.
10. Engineering Drawing and Graphics Using AutoCAD by T. Jeyapoovan, Vikas Publication.
11. Engineering Drawing by Prof. Amar Pathak, WIELY India Publication.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design) Sem. I

(Course - I) DSC – II B.Voc. Paper II
Engineering Drawing Theory: 30 Hours
(Credits: 02)

Unit I: Orthographic Projections **(8 hours)**

Orthographic views: lines used, Selection of views, spacing of views, dimensioning and sections.

Drawing required views (any two views) from given pictorial views (Conversion of pictorial view into orthographic view) including sectional orthographic view

Unit II: Isometric projections **(7 hours)**

Introduction to isometric, Isometric scale, Isometric projections and Isometric views / drawings. Circles in isometric view. Isometric views of simple solids and objects.

Unit III: Development of plane and curved surfaces **(8 hours)**

Development of plane and curved surfaces: of the solids, Prisms, Pyramids, Cylinders and Cones along with cutting planes (Solids in simple position only)

Unit IV: Sketching

(7 hours)

Freehand drawing of human figures, trees, accessories etc.

Reference Books:

1. Engineering Drawingby N. D. Bhatt, Charotor Publication House, Bombay
2. Fundamentals of Engineering by W. J. Luzadder, Drawing, Prentice Hall of India.
3. Engineering Design and Visualization by Jon M.Duff,William A. Ross, CENGAGE Learning
4. Machine Drawing by N. D. Bhatt, Charotor Publication House, Bombay.
5. Graphic Science by French and Vierck, Mc-Graw Hill International.
6. Engineering Drawing and Graphics by K. Venugopal, New Age Publication
7. A text book of Engineering Drawing by R. K. Dhawan, S. Chand and Co.
8. Machine Drawing by K. L. Narayana, New Age Publication
9. Engineering Drawing by N. B. Shaha and B. C. Rana, Pearson Education.
10. Engineering Drawing and Graphics Using AutoCAD by T. Jeyapoovan, Vikas Publication.
11. Engineering Drawing by Prof. Amar Pathak, WIELY India Publication

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design**)**

Sem. I (Course - I) DSC– III B.Voc. Paper III

Basics of Graphics & Engineering Drawing (Practical)

(Credits: 02)

List of Experiments:

Group-I

- **Introduction to Drawing Instruments and Lettering**
  - Proper use of drawing tools
  - Practice of vertical and inclined single-stroke lettering
  - Line types as per BIS standards
- **Geometric Constructions**
  - Division of lines, angles, construction of regular polygons
  - Tangents to circles and arcs, inscribing and circumscribing
- **Curves Used in Engineering**
  - Construction of:
    - Conic sections: Ellipse, Parabola, Hyperbola
    - Cycloidal curves: Cycloid, Epicycloid, Hypocycloid
    - Involute of a circle
    - Spiral and Helix
- **Orthographic Projections of Points and Lines**
  - Projections on HP and VP
  - Line inclined to one or both planes
  - Traces of lines
- **Projection of Planes**
  - Projection of plane figures (triangle, square, pentagon, hexagon, circle)
  - Inclined to one or both reference planes
- **Projection of Solids**
  - Projections of:
    - Cube, prism, pyramid, cylinder, cone
    - Solids in simple and inclined positions
- **Section of Solids**
  - Cutting planes perpendicular or inclined to one of the reference planes
  - True shape of section
- **Development of Lateral Surfaces**
  - Developments of cube, prism, cone, pyramid, and cylinder
  - Applications in sheet metal and packaging
- **Isometric Drawing (Isometric Projection)**
  - Drawing isometric views of simple objects
  - Conversion of orthographic views to isometric
- **Conversion of Isometric View to Orthographic Views**
- Drawing front, top, and side views from a given isometric object
  - Cube, prism, pyramid, cylinder, and cone in various orientations

Group- II

1. **Introduction to Drawing Instruments and Lettering**
   - Types of lines as per BIS/ISO
   - Freehand lettering (vertical and inclined), numbering
   - Use of drawing instruments and sheet layout
2. **Geometric Constructions**
   - Division of lines and angles
   - Construction of regular polygons (triangle, pentagon, hexagon, etc.)
   - Tangents, arcs, and circle-related constructions
3. **Engineering Curves**
   - Ellipse (concentric circles and rectangle method)
   - Parabola and Hyperbola
   - Cycloid, Epicycloid, Hypocycloid
   - Involute and Helix
4. **Orthographic Projection of Points and Lines**
   - Points in different quadrants
   - Lines inclined to one or both reference planes
   - True length and true inclinations
5. **Projection of Planes**
   - Plane figures (triangle, square, hexagon, circle)
   - Planes perpendicular or inclined to HP and/or VP
6. **Projection of Solids**
   - Solids: Cube, prism, pyramid, cylinder, and cone
   - Solids resting on HP and inclined to VP, and vice versa
7. **Section of Solids**
   - Sectional views of solids cut by planes
   - True shape of the section
8. **Development of Surfaces**
   - Development of prisms, pyramids, cylinders, and cones
   - Applications in sheet metal and packaging
9. **Isometric Projection**
   - Isometric scale
   - Isometric views of simple machine parts or blocks
10. **Conversion of Isometric to Orthographic Views**

    Drawing front, top, and side views from an isometric figure

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I(Building Technology and Interior Design)

Sem. I (Course - II) DSC–I B.Voc. Paper I Introduction of Building Materials-I

Theory: 30Hours

(Credits: 02)

Unit 1: Introduction to Building Materials (8 hours)

- Classification of materials
- Requirements of good building materials
- Selection criteria

- **Unit 2 :Stones** **(7 hours)**
- Types of stones (granite, basalt, sandstone, limestone, marble, slate, etc.)
- Quarrying, dressing, and tests on stones
- Uses in construction

- **Unit 3:** Bricks & Clay Products **(8 hours)**
- Properties of good bricks
- Manufacturing of bricks
- Types of bricks (fly ash, refractory, hollow, engineering bricks)
- Clay tiles, terracotta, earthenware

.

Unit 4: Cement (7 hours)

- Constituents and manufacturing process
- Types of cement (OPC, PPC, Rapid hardening, White cement, etc.)
- Properties and field/lab tests
- Storage of cement

Reference Books

- **Building Materials** – S.K. Duggal (New Age International)
- **Building Construction and Materials** – Gurcharan Singh
- **Engineering Materials** – Rangwala S.C.
- **Building Materials** – B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain
- **Building Materials and Construction** – G.C. Sahu & Joygopal Jena
- **Civil Engineering Materials** – N. Subramanian
- **Building Materials** – P.C. Varghese (Prentice Hall India)
- **Construction Materials** – M.L. Gambhir

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design)

Sem. I (Course - II) DSC– II B.Voc.Paper II Introduction of Building Materials-II

Theory: 30 Hours

(Credits: 02)

Unit 1: Modern & Green Building Materials **(8 hours)**

- Gypsum products (plasterboard, POP)
- Lightweight concrete blocks (AAC, CLC)
- Recycled materials
- Sustainable/eco-friendly materials

- **Unit 2 : Lime & Pozzolanic Materials, Mortar** **(7 hours)**

- Types of lime
- Properties and uses
- Pozzolanas: fly ash, silica fume, rice husk ash
- Types of mortar (cement, lime, mud, gypsum)
- Properties and tests
- Uses in masonry and plastering

- **Unit 3 : Timber & Wood Products** **(8 hours)**

- Types of timber and defects
- Seasoning and preservation
- Plywood, particle board, MDF, veneers
- Bamboo as a construction material

- **Unit 4 : Paints, Varnishes & Finishes** **(7 hours)**
- Ingredients of paint, types, and defects
- Distempers, emulsions, enamels
- Varnishes, polishes, whitewash

1. Reference Books :

2. **Building Materials** – S.K. Duggal (New Age International)
3. **Building Construction and Materials** – Gurcharan Singh
4. **Engineering Materials** – Rangwala S.C.
5. **Building Materials** – B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain
6. **Building Materials and Construction** – G.C. Sahu & Joygopal Jena
7. **Civil Engineering Materials** – N. Subramanian
8. **Building Materials** – P.C. Varghese (Prentice Hall India)
9. **Construction Materials** – M.L. Gambhir

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design)

Sem. I (Course - II) DSC– III B.Voc. Paper III

Introduction of Building Materials-I & Introduction of Building Materials-II (Practical)

(Credits: 02)

List of Experiments:

- **Group- I**

- **Water absorption of bricks** — porosity & durability indicator.
- **Compressive strength of bricks / building blocks** — load-bearing capacity.
- **Efflorescence test on bricks** — salt deposition tendency.
- **Shape & size tolerances, warpage and crushing load for blocks** — QA checks.
- **Fineness of cement (sieve/air-permeability test)** — check surface area / particle fineness.
- **Standard consistency of cement** — determine % water for standard paste.
- **Initial & final setting time of cement** — measure time for paste to set.
- **Soundness of cement (expansion test)** — detect excessive volume change.
- **Compressive strength of cement mortar cubes** — strength development of cement.
- **Slump test for fresh concrete** — workability of concrete mix.
- **Compaction factor test** — alternative workability measurement.
- **Compression test on hardened concrete cubes/cylinders** — characteristic strength.
- **Split tensile strength of concrete cylinder** — tensile behavior of concrete.
- **Flexural strength (modulus of rupture) of concrete beams** — bending strength.
- **Water absorption & voids in concrete** — porosity and permeability indicator.
- **Effect of admixtures on fresh & hardened properties** — slump, strength & setting.

- **Group- II**

- **Particle size distribution (sieve analysis)** — grading curve and fineness modulus.
- **Specific gravity & water absorption of aggregates** — unit weight and porosity.
- **Aggregate impact value test** — toughness / resistance to impact.
- **Aggregate crushing value test** — resistance to crushing under compressive load.
- **Abrasion (Los Angeles) test or equivalent** — resistance to wear.
- **Soundness test (freeze–thaw / salt)** — durability against weathering.
- **Flakiness & elongation index** — particle shape assessment
- **Moisture content of timber (oven-dry method)** — seasonal/moisture behavior.
- **Density and specific gravity of wood** — mechanical property indicator.
- **Bending test on timber (modulus of rupture & elasticity)** — flexural behavior.
- **Hardness test (Janka or shore-based)** — wear resistance.

Suggested Readings:

1. **Building Materials** – S.K. Duggal, New Age International
2. **Building Materials** – B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain
3. **Engineering Materials** – Rangwala S.C.
4. **Civil Engineering Materials** – N. Subramanian
5. **Building Materials and Construction** – G.C. Sahu & Joygopal Jena
6. **Building Materials** – P.C. Varghese

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design)

Sem. I (Course -III) DSC– I

B.Voc. Paper I Elements of Basic Design

Theory: 30 Hours
(Credits: 02)

Unit 1: Principals of design **(8 hours)**

Balance, emphasis, movement, pattern, repetition, proportion, rhythm, variety and unity

Unit 2: Elements of design **(7 hours)**

Point , line

surface

volume

colour

texture and space.

Unit 3: Color Theory & Application **(8 hours)**

color wheel

schemes

psychology of color.

Unit 4: Interior Space Planning **(7 hours)**

circulation
zoning
ergonomics
anthropometrics.

Reference Books:

- **Interior Design Principles and Practice** – Pratap Rao
- Interior D**esign Illustrated** – Francis D.K. Ching
- Time-Sav**er Standards for Interior Design and Space Planning** – Joseph DeChiara, Julius Panero & Martin Zelnik
- **Human Dimension & Interior Space: A Source Book of Design Reference S**tandards – Julius Panero & Martin Zelnik

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design)

Sem. I (Course -III) DSC– II B.Voc.

Paper II Process of Basic Interior Design

Theory: 30 Hours (Credits: 02)

Unit 1 : Process of Design **(8 hours)**

Aspects and prospects of space planning.
Space around furniture items.

Unit 2 : Furniture study **(7 hours)**

Various furniture dimensions

design of single furniture item.

Unit 3 : Concept Development **(8 hours)**

- Research themes, styles, color palettes, mood boards.
- Explore inspiration (traditional, modern, sustainable etc.).
- Develop rough sketches, bubble diagrams, adjacency diagrams.
- Create *concept statement* (the design philosophy in words).

Unit 4 : Space Planning **(7 hours)**

- Arrange spaces according to function and circulation.
- Apply anthropometrics & ergonomics (human dimensions).
- Zoning: public, semi-private, private areas.
- Draft furniture layouts.
- Ensure Vastu / Feng Shui / sustainability (if required by client).

Reference Books :

- **Interior Design Illustrated** – *Francis D.K. Ching*
  - Explains design principles, process diagrams, space planning, visual communication.
- **Interior Design: A Survey** – *John F. Pile*
  - Covers history + design process, furniture, lighting, and practical applications.
- **Interior Design Principles and Practice** – *Pratap Rao*

- Good Indian reference with design methods, elements, and space planning basics.

- **Human Dimension & Interior Space: A Source Book of Design Reference Standards** – *Julius Panero & Martin Zelnik*

- **Time-Saver Standards for Interior Design and Space Planning** – *Joseph DeChiara, Julius Panero, Martin Zelnik*
    - The bible for interior design process, layouts, and standard dimensions.
- **Design Drawing** – *Francis D.K. Ching*
    - For sketching, conceptual drawings, and presenting the design process.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design)

Sem. I (Course - III) DSC– III B.Voc. Paper III Elements of Basic Design & Process of Basic Interior Design (Practical)

(Credits: 02)

List of Experiments:

Group- I

1. Experiment on **Elements of Design** – create compositions using line, shape, form, texture.
2. Experiment on **Principles of Design** – make design boards showing balance, rhythm, harmony, proportion, emphasis.
3. **Color Wheel Preparation** – primary, secondary, tertiary colors.
4. **Color Schemes** – prepare charts of monochromatic, analogous, complementary, triadic, tetradic color schemes.
5. **Color Psychology** – case study of colors used in interiors (restaurant, hospital, school).

6. **Orthographic Projections** of simple furniture (chair, table, cupboard).
7. **Isometric / Axonometric Drawing** of a small room interior.
8. **One-point and Two-point Perspective Drawing** of interiors.
9. **Freehand Sketching Exercises** – quick sketches of furniture & room views.

10. **Anthropometric Study** – prepare charts of human dimensions & ergonomics.
11. **Furniture Layout of Bedroom / Living Room** – with circulation space marked.
12. **Bubble Diagram & Zoning** exercise for residential interior.
13. **Kitchen Planning Experiment** – work triangle & layout types (L, U, parallel).
14. **Toilet & Bathroom Layout Study** – plumbing & space requirement.

Group- II

1. **Anthropometric Study** – prepare charts of human dimensions & ergonomics.
2. **Furniture Layout of Bedroom / Living Room** – with circulation space marked.
3. **Bubble Diagram & Zoning** exercise for residential interior.
4. **Kitchen Planning Experiment** – work triangle & layout types (L, U, parallel).
5. **Toilet & Bathroom Layout Study** – plumbing & space requirement.
6. **Identification & Sample Board Preparation** – wood, tiles, glass, fabrics, paints.
7. **Texture Board Preparation** – natural vs artificial textures.
8. **Surface Finishes** – wall, flooring, ceiling samples.
9. **Lighting Experiment** – study of daylight vs artificial light on colors & textures.
10. **Interior Accessories Study** – effect of rugs, curtains, cushions on interiors.
11. **Model Making / Mood Board Preparation** – concept presentation for a space.

Suggested Readings:

1. **Design Basics** – David A. Lauer & Stephen Pentak
2. **The Elements of Design** – Gail Greet Hannah
3. **Color in Interior Design** – John F. Pile
4. **Colour: How to Use Colour in Art and Design** – Edith Anderson Feisner

5. **Design Drawing** – Francis D.K. Ching
6. **Interior Design Illustrated** – Francis D.K. Ching
7. **Architectural Graphics** – Francis D.K. Ching
8. **Drawing for Interior Design** – Drew Plunkett

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design)

Sem.I OPEN ELECTIVE - I

Landscape & Outdoor Design (Practical)

(Credits: 02)

List of Practical

Group-I

1. **1. Preparation of Landscape Elements Chart** – trees, shrubs, ground covers, climbers (with sketches & notes).
2. **Drawing of Planting Symbols** – standard graphic symbols for trees, hedges, lawns, water bodies, pathways.
3. **Color & Texture Experiment** – composition of plants based on leaf color, size, and texture.
4. **Preparation of Bubble Diagrams** – functional zoning for a small garden / park.
5. **Paving Pattern Design** – sketches & models of walkways and courtyards.
6. **Water Feature Design** – fountains, ponds, cascades (concept drawings).
7. **Outdoor Furniture & Lighting Layout** – placement and design exercise.
8. **Pergola / Gazebo / Trellis Study** – drawings or small models.

Group-II

1. **Design of a Residential Garden** – with planting, pathways, seating, lighting.
2. **Design of a Public Park** – zoning of play area, lawns, water body, seating.
3. **Campus / Institutional Landscape Planning** – roads, plantations, open spaces.
4. **Case Study of an Existing Garden / Park** – analysis of planting scheme, circulation, and user experience
5. **Preparation of Planting Plan** – for residential garden (front yard/backyard).
6. **Design of Avenue Plantation** – road / campus with suitable trees.
7. **Theme Garden Design** – herbal garden, rock garden, water garden, Zen garden.
8. **Roof-top / Terrace Garden Planning** – small-scale layout with lightweight planting.

शिवाजी शवद्यापीठ, कोल्हापूर

बी. व्होक. भाग – I (बिल्डिंग टेक्नोलोजी अन्ड इंटेरिअर डिझाईन)

NEP 2020 (2.0) जनू 2025 पासनू लागू अभ्यासक्रम बी. व्होक. I (बिल्डिंग टेक्नोलोजी अन्ड इंटेरिअर डिझाईन)

सेफमस्टर – I

ओपन इलेफरिव्ह – I प्रगत िोटोशॉप (प्रात्यफिक) (क्रेफिट्स: 02)

प्रॅक्टिकल गट - I

1. परिदृश्य घटकांचा चार्ट तयार करणे – झाडे, झुडपे, ग्राउंड कव्हर्स, वेल (चित्र व टिपांसह).
2. रोपांच्या प्रतिकात्मक चिन्हांची रेखाटने – झाडे, कुंपण, गवत, पाण्याचे तळे, पायवाटी.
3. रंग व पोत प्रयोग – पानांच्या रंग, आकार व पोतानुसार रचना.
4. बबल डायग्राम तयार करणे – लहान बाग/उद्यानाचे कार्यात्मक झोनिंग.
5. फरशी/पेव्हिंग पॅटर्न डिझाईन – पायवाट व अंगणासाठी रेखाचित्रे/मॉडेल.
6. जलतत्व डिझाईन – फौवारा, तळे, झरा (संकल्पना रेखाचित्रे).
7. बाह्य फर्निचर व प्रकाश योजना – ठेवणी व डिझाईन सराव.
8. पर्गोला / गॅझेबो / ट्रेलिस अभ्यास – रेखाचित्रे किंवा लघु मॉडेल.

प्रॅक्टिकल गट - II

1. निवासी बागेचे डिझाईन – लागवड, पायवाट, बसण्याची जागा, प्रकाश योजना.
2. सार्वजनिक उद्यानाचे डिझाईन – खेळाची जागा, लॉन, पाण्याचे तळे, बसण्याची जागा.
3. कॅम्पस / संस्थेचे परिदृश्य नियोजन – रस्ते, लागवड, मोकळी मैदाने.
4. विद्यमान बाग/उद्यान केस स्टडी – लागवड पद्धती, वापरकर्ता अनुभव, व वाहतूक विश्लेषण.
5. निवासी बागेसाठी लागवड आराखडा तयार करणे – पुढील व मागील अंगणासाठी.
6. रस्त्याच्या दुतर्फा झाडांची लागवड योजना – रस्ते/कॅम्पससाठी योग्य झाडांची निवड.
7. थीम गार्डन डिझाईन – औषधी वनस्पती उद्यान, रॉक गार्डन, वॉटर गार्डन, झेन गार्डन.
8. छतावरील/टेरेस गार्डन योजना – हलक्या वजनाच्या लागवडीसह लघु डिझाईन.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design)

Sem. II (Course - I) DSC–I B.Voc. Paper I - 3 D Visualization

Theory: 30 hours
(Credits: 02)

Unit I: Basics of 3D Visualization (8 hours)

- Introduction to **3D Geometry**
- Coordinate systems (X, Y, Z axes)
- Difference between **2D and 3D representations**
- Types of 3D Projections (Parallel vs Perspective)

Unit II: Isometric views (7 hours)

- Basics of Isometric Drawing
- Isometric Construction Methods
- Isometric Projections of Simple Objects
- Isometric Projection of Engineering Features
- Advanced Isometric Topics

Unit III: Axonometric views (8hours)

- Introduction
- Types of Axonometric Views
- **Construction Principles**
- Applications in Drawing
- Advanced Topics

Unit IV: Oblique views (7 hours)

- **Introduction**
- Types of Oblique Projection
- **Construction Principles**
- Oblique Projection of Objects
- Circles and Curves in Oblique View
- Applications

Reference Books:

- **Engineering Drawing & Graphics** – K.V. Natarajan
- **Engineering Drawing** – N.D. Bhatt
- **Engineering Graphics with AutoCAD** – James D. Bethune
- **Engineering Graphics** – P.S. Gill
- **A Textbook of Engineering Graphics** – R.K. Dhawan
- **Mastering AutoCAD & AutoCAD LT** – George Omura
- **SolidWorks Bible** – Matt Lombard

- **Introduction to 3D Modeling Using SketchUp** – James H. Johnson
- **Revit Architecture User Guide** – Autodesk Official Guide

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I ((Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I ((Building Technology and Interior Design)

Sem. II (Course - I) DSC–II B.Voc. Paper II perspective views Theory: 30 hours
(Credits: 02)

Unit I: Introduction to Perspective (8 hours)

- Meaning of perspective projection
- Difference between **orthographic, axonometric, oblique, and perspective**
- Importance of perspective in engineering, architecture & design
- Elements of perspective: **Station Point (SP), Picture Plane (PP), Ground Line (GL), Horizon Line (HL), Vanishing Point (VP)**

Unit II: Types of Perspective Projection (7 hours)

- **One-Point Perspective (Parallel Perspective)**
  - Objects with one set of faces parallel to picture plane
  - Single vanishing point on horizon line
- **Two-Point Perspective (Angular Perspective)**
  - Objects inclined to picture plane
  - Two vanishing points on horizon line
- **Three-Point Perspective (Oblique Perspective)**
  - Object tilted so vertical edges also converge
  - Three vanishing points (two on HL, one above/below HL)

Unit III: Construction Methods (8 hours)

- Visual ray method
- Vanishing point method
- Measuring line method
- Perspective grid method

Unit IV: Advanced Perspective Topics (7 hours)

- Foreshortening in perspective
- Distance points & measuring points

- Perspective of circles, arcs, and curves
- Sectional perspective views
- Interior & exterior perspective views (architectural drawings)

Reference Books:

- **Engineering Drawing** – N.D. Bhatt
- **Engineering Graphics** – P.J. Shah
- **Engineering Drawing and Design** – David A. Madsen & David P. Madsen
- **Engineering Drawing** – K.V. Natarajan
- **Geometrical and Engineering Drawing** – K.C. John
- **Architectural Graphics** – Francis D.K. Ching
- **Design Drawing** – Francis D.K. Ching & Steven P. Juroszek
- **Drawing and Perceiving: Real-World Drawing for Students of Architecture and Design** – Douglas Cooper
- **Freehand Perspective and Sketching** – Dora Miriam Norton
- **Perspective Made Easy** – Ernest R. Norling

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design)

Sem. II (Course - I) DSC– III B.Voc. Paper III 3 D Visualization & Perspective Views (Practical)

(Credits: 02)

Group I

- Study of **3D coordinate system** (X, Y, Z axes).
- Drawing **orthographic views** of simple objects.
- Converting **orthographic views into pictorial (3D) views**.
- Introduction to **3D CAD software** (AutoCAD / SolidWorks / SketchUp).
- Creating **3D wireframe models**.
- Creating **3D surface models**.
- Creating **3D solid models**.
- Applying **rendering and shading**.
- Generating **3D views from orthographic drawings** using CAD.
- Perspective view of solids using **visual ray method**.
- One-point perspective of a prism/pyramid.
- Two-point perspective of a cube or rectangular block.
- Three-point perspective of a tall building/object.

Group II

- Study of **elements of perspective** – Station Point (SP), Picture Plane (PP), Ground Line (GL), Horizon Line (HL), Vanishing Point (VP).
- Difference between **Orthographic, Axonometric, Oblique, and Perspective** views (demonstration with models/drawings).
- Construction of **one-point perspective** of a cube resting on ground line.
- One-point perspective of a **rectangular block/prism** placed above ground line.
- One-point perspective of **interior of a room / corridor**.

- Construction of **two-point perspective** of a cube with edges inclined to PP.
- Two-point perspective of a **rectangular prism with openings/slots**.
- Two-point perspective of a **pyramid or cylinder**.
- Two-point perspective of **simple architectural objects** (building façade, furniture, etc.).
- **Sectional perspective** of solids.
- **Combination of solids** in perspective (cube + cylinder, prism + pyramid).
- **Interior perspective** of furniture arrangement.
- **Exterior perspective** of a small building using vanishing point method.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design**)**

Sem. II (Course - II) DSC– I B.Voc.Paper I

Concrete Technology

Theory: 30 hours

(Credits: 02)

Unit 1 : Introduction to Concrete **(8 hours)**

- Definition & importance of concrete
- History and development of cement & concrete
- Applications in construction

Unit 2 : Cement , Aggregates, Water & Admixtures **(7 hours)**

- Types of cement (OPC, PPC, Rapid Hardening, Low Heat, etc.), Fine & Coarse aggregates
- Composition and manufacturing of cement
- Properties of cement (fineness, setting time, strength, soundness), Properties of aggregates (shape, texture, size, specific gravity, bulking)
- Field & laboratory tests on cement, Tests on aggregates (sieve analysis, impact, crushing, abrasion tests)

Unit 3: Fresh Concrete and Hardened Concrete

- Workability (definition & factors affecting)
- Tests for workability (slump test, compaction factor test, Vee-Bee test, flow table test)
- Mixing, transporting, placing, compaction, curing methods
- Strength properties (compressive, tensile, flexural strength)
- Stress-strain characteristics
- Durability (permeability, shrinkage, creep)
- Non-destructive testing of hardened concrete (rebound hammer, ultrasonic pulse velocity, core test)

(8 hours)

.

Unit 4: Special Concretes **(7 hours)**

- High strength concrete
- High performance concrete
- Self-compacting concrete
- Fiber reinforced concrete
- Ready-mix concrete
- Lightweight & heavyweight concrete
- Polymer concrete

Reference Books :

- **Concrete Technology: Theory and Practice** – M.S. Shetty
- **Concrete Technology** – A.R. Santhakumar
- **Concrete Technology** – M.L. Gambhir
- **Properties of Concrete** – A.M. Neville
- **Concrete Technology** – R. Varshney
- **Design of Concrete Mixes** – N. Krishna Raju
- **High-Performance Concrete** – Pierre-Claude Aitcin

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B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design)

Sem. II (Course - II) DSC– I B.Voc.Paper I Construction technology Theory: 30 hours (Credits: 02)

Unit 1 : Introduction

- Definition & scope of construction technology
- Construction industry overview
- Role of construction materials and methods

(8 hours)

Unit 2 : Foundation Engineering **(7 hours)**

- Types of foundations (shallow & deep)
- Excavation and earthwork methods
- Dewatering techniques
- Pile foundations & caissons

Unit 3 : Masonry & Walls **(8 hours)**

- Types of masonry (brick, stone, block)
- Bonds in brickwork
- Partition walls & cavity walls
- Prefabricated wall panels

Unit 4 : Flooring, Roofing & Finishing **(7 hours)**

- Types of floors (tile, marble, terrazzo, timber, concrete, modern finishes)
- Types of roofs (flat, pitched, trussed, shell, RCC slab, modern roofs)
- Plastering, pointing, painting & varnishing

Reference Books :

- **Building Construction** – B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain
- **Building Construction** – S.C. Rangwala
- **Building Construction** – P.C. Varghese
- **Construction Technology** – R. Chudley & R. Greeno (widely used in architecture & construction courses)
- **Building Materials and Construction** – S.S. Bhavikatti
- **Building Materials** – S.K. Duggal
- **Building Materials** – Rangwala
- **Construction Technology (Volumes I–IV)** – R. Barry
- **Construction Materials, Methods and Techniques** – William P. Spence & Eva Kultermann

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B. Voc. Part I (Building Technology and Interior Design)
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B. Voc. I (Building Technology and Interior Design)

Sem. II (Course - II) DSC– III B.Voc. Paper III Concrete Technology & Construction technology

(Practical) (Credits: 02)

List of Experiments:

Group- I

- Determination of **consistency of cement** (Vicat apparatus).
- Determination of **initial & final setting time of cement**.
- Determination of **specific gravity of cement**.
- Determination of **fineness of cement** (sieve test / Blaine's air permeability method).
- Determination of **compressive strength of cement mortar cubes**.
- Determination of **soundness of cement** (Le-Chatelier test).
- Determination of **workability by slump cone test**.
- Determination of **compaction factor test**.
- Determination of **Vee-Bee consistometer test**.
- Determination of **flow table test**.
- **Rebound hammer test**.
- **Ultrasonic pulse velocity test (UPV)**.
- Core cutting and testing.

Group- II

- **Field density of soil** (core cutter / sand replacement method).
    - **California Bearing Ratio (CBR) test**.
- **Standard Proctor Compaction test**.
- **Atterberg limits** (liquid limit, plastic limit, shrinkage limit).
- Demonstration of **brick bonds** (English, Flemish, header, stretcher).
- Preparation of **cement mortar** and **plastering practice**.
- Demonstration of **formwork & scaffolding systems**.
- Demonstration of **reinforcement detailing** (bending, cutting, tying of steel bars).
- Demonstration of **staircase models** (dog-legged, open well, spiral).
- Visit / demo of **modern construction equipment** (concrete mixer, vibrators, batching plant).
- Introduction to **prefabricated construction components**.
- Demonstration of **modular building techniques**.

- Case study / mini-project on **green building materials**.

Reference Books – (Practical)

1. **"Building Construction" – B.C. Punmia, Ashok Kumar Jain & Arun Kumar Jain**
   (Laxmi Publications)
   → Standard textbook covering all construction practices, materials, and techniques.
2. **"Building Construction" – S.C. Rangwala**
   (Charotar Publishing)
   → Covers brickwork, stone masonry, RCC, flooring, roofing, finishes, etc.
3. **"Building Construction" – P.C. Varghese**
   (Prentice Hall India)
   → Good for modern techniques, prefabrication, and construction equipment.
4. **"Construction Technology" – R. Chudley & R. Greeno**
   (Pearson)
   → Widely used internationally; explains practical construction methods with illustrations.
5. **"Building Construction Handbook" – R. Chudley & R. Greeno**
   (Routledge, UK)
   → Detailed drawings, sketches, and modern construction details.
6. **"Building Construction Illustrated" – Francis D.K. Ching**
   (Wiley)
   → Best for architecture students; graphical explanations of construction processes.
7. **"Civil Engineering Materials & Construction" – Sushil Kumar**
   → Covers both materials testing & construction methods.
8. **"Construction Technology" – Tony Bryan, Eugene J. Weiss & others**
   → International perspective on building and civil works.
9. **IS Codes & Handbooks (BIS – Bureau of Indian Standards)**
   - IS 456: Code of Practice for Plain & Reinforced Concrete
   - IS 800: Code of Practice for Steel Structures
   - IS 1905: Code of Practice for Structural Use of Unreinforced Masonry
   - SP:7 – National Building Code (NBC)

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design)

Sem. II (Course - III) DSC– I B.Voc. Paper I Residential interior design- I

Theory: 30 hours

(Credits: 02)

Unit 1 : Introduction to Residential Design **(8 hours)**

- Importance of interiors in homes
- Concept of *home as a functional + emotional space*
- Overview of design process for residences

Unit 2 : Anthropometry & Ergonomics in Residences **(7 hours)**

- Human dimensions & clearances for residential spaces
- Ergonomic standards for furniture in living, dining, bedroom, kitchen
- Circulation spaces & movement patterns

Unit 3 : Space Planning Principles **(8 hours)**

- Zoning: public, semi-private, and private spaces
- Functional relationships between rooms (living, dining, kitchen, bedrooms, toilets, utility)
- Furniture layouts and circulation efficiency
- Open vs. closed planning

Unit 4 : Sustainability in Residential Interiors **(7 hours)**

- Eco-friendly materials & finishes
- Energy-efficient lighting & ventilation
- Indoor plants and biophilic design

Reference Books :

- **"Interior Design" – Ahmed A. Kasu**

→ Standard Indian reference, covers residential planning, furniture, color, and materials.

- **“Time-Saver Standards for Interior Design and Space Planning” – Joseph DeChiara, Julius Panero & Martin Zelnik**

→ Most widely used book for space standards, anthropometry, and room layouts.

- **“Human Dimension & Interior Space” – Julius Panero & Martin Zelnik**

→ Focused on ergonomics, anthropometry, and furniture clearances in residential interiors.

- **“Interior Design Illustrated” – Francis D.K. Ching**

→ Explains design principles, forms, and space planning with illustrations.

- **“Residential Interior Design: A Guide to Planning Spaces” – Maureen Mitton & Courtney Nystuen**

→ Step-by-step guide to designing functional and aesthetic residential interiors.

- **“Materials for Interior Environments” – Corky Binggeli**

→ Comprehensive guide to finishes and materials used in residential interiors.

- **“Lighting Design Basics” – Mark Karlen & Christina Spangler**

→ Covers residential lighting design, mood creation, and energy efficiency.

- **“Color in Interior Design” – John Pile**

→ Reference for applying color theory and schemes in home interiors.

- **“The Interior Design Reference + Specification Book” – Chris Grimley & Mimi Love**

→ Quick reference guide for dimensions, finishes, and planning standards.

- **National Building Code of India (NBC) & IS Codes**

→ For minimum room sizes, ventilation, sanitary provisions, and safety in residences.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design)

Sem. II (Course - III) DSC– I B.Voc. Paper I Residential interior design- II Theory: 30 hours

(Credits: 02)

Unit 1 : Advanced Space Planning **(8 hours)**

- Zoning refinement: public, semi-private, private spaces
- Multi-functional spaces & flexible layouts
- Open plan vs compartmentalized layouts
- Circulation efficiency & accessibility (including barrier-free design)

Unit 2 : Furniture Design & Layouts **(7 hours)**

- Customized furniture design for residential spaces
- Built-in vs free-standing furniture
- Ergonomic furniture design for various rooms
- Storage solutions: wardrobes, cabinets, multifunctional units

Unit 3 : Kitchen & Utility Areas (Advanced) **(8 hours)**

Topics:

- Modular kitchen design & fittings
- Work triangle optimization
- Service area planning (laundry, pantry, utility rooms)
- Integration of appliances & storage

Unit 4 : Sustainability & Green Design **(7 hours)**

- Energy-efficient solutions (lighting, HVAC, appliances)
- Water-saving fixtures and rainwater harvesting integration
- Use of recycled, low-VOC, and renewable materials
- Indoor air quality and biophilic design

ReferenceBooks :

- **"Residential Interior Design: A Guide to Planning Spaces" – Maureen Mitton & Courtney Nystuen**
→ Step-by-step guidance on complete residential planning and layouts.

- **"Interior Design" – Ahmed A. Kasu**
→ Covers residential interiors, furniture design, and space planning.

- **"Interior Design Illustrated" – Francis D.K. Ching**
→ Visual guide to spatial organization, materials, and furniture detailing.

- **"Human Dimension & Interior Space" – Julius Panero & Martin Zelnik**
→ Essential for ergonomics, anthropometry, and furniture clearances in homes.

- **"Time-Saver Standards for Interior Design and Space Planning" – Joseph DeChiara, Julius Panero & Martin Zelnik**
→ International standard for space planning, clearances, and furniture layouts.

- **"Materials for Interior Environments" – Corky Binggeli**
→ Detailed guide on materials, finishes, sustainability, and surface treatments.

- **"Lighting Design Basics" – Mark Karlen & Christina Spangler**
→ Covers ambient, task, accent lighting, and residential lighting planning.

- **“Color in Interior Design” – John Pile**

→ Advanced color schemes, feature walls, and color psychology for interiors.

- **“The Interior Design Reference + Specification Book” – Chris Grimley & Mimi Love**

→ Quick reference for furniture dimensions, materials, finishes, and lighting.

- **National Building Code of India (NBC) & Relevant IS Codes**
    - For minimum room sizes, ventilation, sanitary requirements, and safety in residences.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design)

Sem. II (Course - III) DSC– III B.Voc. Paper III

Residential interior design- I & Residential interior design- II

(Credits: 02)

Group I

- Redesign of a residential layout optimizing **circulation and zoning** (public, semi-private, private).
- Multi-functional space planning (e.g., living/dining combo, study-cum-guest room).
- Barrier-free / accessible design layouts for residences.
- Design of **customized furniture units** (wardrobes, modular storage, seating).
- Built-in vs. free-standing furniture planning for rooms.
- Ergonomic study of furniture placement for living room, bedroom, kitchen.
- Modular kitchen layout exercise (L-shaped, U-shaped, island, parallel).
- Service area planning including laundry, pantry, and utility spaces.
- Integration of appliances and storage solutions.

Group II

- Layered lighting plan for a residential apartment (ambient, task, accent).
- Electrical layout including switches, sockets, and lighting points.
- Lighting design for mood, aesthetics, and functionality.

- Selection of flooring, wall, and ceiling finishes for each room.
- Material combination studies (wood, stone, metal, glass, laminates).
- Color scheme planning and application (feature walls, palettes, textures).
- • Door, window, and partition detailing in plan and elevation.
- • False ceiling & bulkhead design for living room / bedroom.
- • Staircase, railing, and handrail detailing for residential interiors.
- • Cabinet, shelf, and storage detailing exercises.

Reference Books- (Practical) –

- **“Residential Interior Design: A Guide to Planning Spaces” – Maureen Mitton & Courtney Nystuen**

→ Step-by-step guidance on residential planning, layouts, furniture, and finishes.

- **“Interior Design” – Ahmed A. Kasu**

→ Covers advanced residential interiors, furniture, and space planning techniques.

- **“Interior Design Illustrated” – Francis D.K. Ching**

→ Visual guide to advanced space organization, materials, furniture, and detailing.

- **“Human Dimension & Interior Space” – Julius Panero & Martin Zelnik**

→ Essential for ergonomics, anthropometry, and furniture clearances in residences.

- **“Time-Saver Standards for Interior Design and Space Planning” – Joseph DeChiara, Julius Panero & Martin Zelnik**

→ International standards for furniture layouts, room dimensions, circulation, and clearances.

- **“Materials for Interior Environments” – Corky Binggeli**

→ Detailed guide to finishes, surfaces, sustainable materials, and eco-friendly alternatives.

- **“Lighting Design Basics” – Mark Karlen & Christina Spangler**

→ Ambient, task, and accent lighting for residential spaces; energy-efficient design.

- **“Color in Interior Design” – John Pile**

→ Advanced color schemes, feature walls, and color psychology for residential interiors.

- **“The Interior Design Reference + Specification Book” – Chris Grimley & Mimi Love**

→ Quick reference for furniture dimensions, finishes, materials, and lighting.

- **National Building Code of India (NBC) & Relevant IS Codes**

→ For minimum room sizes, ventilation, sanitary provisions, electrical layouts, and safety in residences.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Syllabus with effect from June 2025

B. Voc. I (Building Technology and Interior Design)

Sem.II OPEN ELECTIVE - II Auto-Cad (Practical)

Basics of AutoCAD

1. Introduction to AutoCAD interface, menus, and toolbars.
2. Drawing basic geometric shapes: line, circle, rectangle, polygon, ellipse.
3. Use of **coordinate systems** (absolute, relative, polar).
4. Drawing using **Ortho, Snap, Grid, and Tracking** features.
5. Basic **editing commands**: move, copy, rotate, scale, mirror, offset, trim, extend, fillet, chamfer.

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2. Layers, Properties & Annotation

6. Creating and managing **layers**.
7. Assigning **line types, colors, and thickness**.
8. Using **object properties** and modifying them.
9. Adding **text (single line & multi-line)**.
10. Adding **dimensions** (linear, aligned, angular, radius, diameter).
11. Using **hatching and gradients** for sections and areas.

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3. Advanced Drawing & Editing

12. Drawing **polylines and splines**.
13. Working with **blocks**: creating, inserting, and editing.
14. Using **groups and arrays** (rectangular, polar, path).
15. Working with **Xrefs (External References)**.
16. Using **viewports, zoom, and pan** for layout management.

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4. 2D Drafting & Detailing

17. Preparation of **floor plans** for buildings.
18. Drawing **elevation and section views** of a simple structure.
19. Detailing **furniture, doors, and windows** in plans.
20. Creating **schematic diagrams** (plumbing, electrical).

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5. 3D Modeling & Visualization

21. Introduction to 3D workspace and coordinate systems.
22. Creating **3D solids**: box, cylinder, sphere, cone, wedge, torus.
23. 3D **editing commands**: union, subtract, intersect, fillet, chamfer.
24. Creating **3D surfaces** and meshes.
25. Applying **materials, textures, and colors** to 3D objects.
26. Setting up **lighting, camera, and rendering** for visualization.

6. Layout, Printing & Presentation

27. Creating **layouts and title blocks**.
28. Setting up **scales and viewports**.
29. Plotting / printing drawings to scale.
30. Exporting drawings as **PDF, DWG, or image files**.

7. Mini Projects / Application Exercises

31. Drawing a **residential floor plan with furniture layout**.
32. Creating a **mechanical part in 2D & 3D**.
33. Drawing a **site plan / landscape layout**.
34. 3D model of a **small building / pavilion** with rendered views.
35. Interior layout of a **living room / bedroom** in 3D.

Reference Books

- **"AutoCAD 2025 For Beginners" – CADCIM Technologies**

→ Step-by-step guide for beginners with exercises in 2D and 3D drafting.

- **"Mastering AutoCAD 2023 and AutoCAD LT 2023" – George Omura & Brian C. Benton**

→ Comprehensive reference covering all commands, 2D drafting, 3D modeling, and advanced tools.

- **"AutoCAD 2023 and AutoCAD LT 2023 Bible" – Ellen Finkelstein**

→ Detailed guide on AutoCAD features, practical exercises, and tips for drafting and modeling.

- **"AutoCAD 2023 Tutorial First Level 2D Fundamentals" – Randy H. Shih**

→ Practical exercises for beginners focusing on 2D drawing and editing techniques.

- **"AutoCAD 3D Modeling & Design" – Munir Hamad**

→ Focused on 3D commands, solid modeling, surfaces, rendering, and visualization.

- **"AutoCAD 2023 and AutoCAD LT 2023 for Interior Design and Space Planning" – Ernest R. Norling**

→ Tailored for interior design applications, space planning, furniture layouts, and detailing.

- **"Architectural Drafting & Design with AutoCAD 2023" – Alan Jefferis & David A. Madsen**

→ Focuses on architectural drawing, floor plans, elevations, sections, and 3D visualization.

- **"AutoCAD Platform Customization: User Interface, Automation, and Programming" – Lee Ambrosius**

→ For advanced users interested in customization, macros, and automation.

- **"Engineering Drawing and AutoCAD" – K.L. Narayana, P. Kannaiah**

→ Combines engineering drawing principles with AutoCAD exercises for students.

- **Online Resources / Autodesk Official Tutorials**

→ Autodesk website offers free tutorials, exercises, and sample projects.

शिवाजी शवद्यापीठ, कोल्हापूर

बी. व्होक. भाग – I (बिल्डिंग टेक्नोलोजी अन्ड इंटेरिअर डिझाईन) **NEP** 2020 (2.0) जनू 2025 पासनू लागू अभ्यासक्रम बी. व्होक. I (बिल्डिंग टेक्नोलोजी अन्ड इंटेरिअर डिझाईन) सेफमस्टर – II ओपन इलेफरिव्ह – II प्रगत ि◌ोटोशॉप (प्रात्यफिक) (क्रेफिट्स: 02)

प्रात्यफिकांची यादी: गट – I

एकक १: AutoCAD चे मूलभूत तत्त्वे

1. **AutoCAD इंटरफेस, मेन्यू, टूलबार**
   - **उद्देश:** AutoCAD workspace आणि टूलबारची ओळख.
   - **प्रक्रिया:** AutoCAD उघडा, इंटरफेस, मेन्यू आणि टूलबार एक्सप्लोर करा.
   - **अपेक्षित परिणाम:** विद्यार्थी AutoCAD workspace स्वतंत्रपणे वापरू शकतात.
2. **बेसिक ज्यामितीय आकार रेखाटणे (Line, Circle, Rectangle, Polygon, Ellipse)**
   - **उद्देश:** 2D shapes तयार करणे.
   - **प्रक्रिया:** दिलेल्या परिमाणानुसार shapes रेखाटणे.
   - **अपेक्षित परिणाम:** अचूक 2D shapes तयार होतात.
3. **Coordinate system वापरणे (Absolute, Relative, Polar)**
   - **उद्देश:** Coordinates वापरून अचूक shapes रेखाटणे.
   - **प्रक्रिया:** वेगवेगळ्या coordinate system वापरून lines आणि shapes रेखाटणे.
   - **अपेक्षित परिणाम:** Shapes अचूक रेखाटल्या जातात.
4. **Ortho, Snap, Grid, Tracking वापरून रेखाटणे**
   - **उद्देश:** अचूक object रेखाटण्यासाठी drawing aids वापरणे.
   - **प्रक्रिया:** Drawing aids enable करून objects draw करा.
   - **अपेक्षित परिणाम:** Objects अचूक align आणि position केले जातात.
5. **Basic editing commands (Move, Copy, Rotate, Scale, Mirror, Offset, Trim, Extend, Fillet, Chamfer)**
   - **उद्देश:** AutoCAD मधील modification commands शिकणे.
   - **प्रक्रिया:** Commands वापरून existing drawing modify करा.
   - **अपेक्षित परिणाम:** Drawing योग्य प्रकारे बदललेले दिसते.

एकक २: Layers, Properties & Annotation

6. **Layers तयार करणे व व्यवस्थापन**
   - **उद्देश:** विविध घटक वेगळ्या लेयरवर ठेवणे.
   - **प्रक्रिया:** लेयर तयार करा, रंग व line type assign करा.

- **अपेक्षित परिणाम:** Drawing व्यवस्थित व्यवस्थापित होते.

7. **Line type, color, thickness assign करणे**
   - **उद्देश:** Object ला गुणधर्म देणे.
   - **प्रक्रिया:** Object select करून गुणधर्म assign करा.
   - **अपेक्षित परिणाम:** Object योग्य रंग, thickness व line type सह दिसतो.
8. **Object properties वापरणे व बदलणे**
   - **उद्देश:** Object गुणधर्म बदलणे.
   - **प्रक्रिया:** Object select करून property modify करा.
   - **अपेक्षित परिणाम:** Object चे गुणधर्म योग्य बदलले जातात.
9. **Text add करणे (Single line & Multi-line)**
   - **उद्देश:** Text जोडणे.
   - **प्रक्रिया:** Drawing मध्ये Text जोडणे.
   - **अपेक्षित परिणाम:** Text योग्यरित्या दिसतो.
10. **Dimension add करणे (Linear, Aligned, Angular, Radius, Diameter)**
    - **उद्देश:** Length, angle, radius मोजणे.
    - **प्रक्रिया:** Dimensions add करा.
    - **अपेक्षित परिणाम:** Drawing मध्ये अचूक dimension दिसतो.
11. **Hatching व Gradients वापरणे**
    - **उद्देश:** Sections / areas भरून दाखवणे.
    - **प्रक्रिया:** Section fill करण्यासाठी hatch pattern वापरा.
    - **अपेक्षित परिणाम:** Drawing मध्ये section / area अचूक fill होते.

एकक ३: Advanced Drawing & Editing

12. **Polyline आणि Spline रेखाटणे**
    - **उद्देश:** जटिल shapes तयार करणे.
    - **प्रक्रिया:** Polyline / Spline command वापरून complex shapes रेखाटणे.
    - **अपेक्षित परिणाम:** Complex shapes अचूक तयार होतात.
13. **Blocks तयार करणे व edit करणे**
    - **उद्देश:** Reusable objects तयार करणे.
    - **प्रक्रिया:** Object select करून block तयार करा व insert करा.
    - **अपेक्षित परिणाम:** Drawing मध्ये blocks अचूक insert / edit होतात.
14. **Groups व Arrays वापरणे**
    - **उद्देश:** Object repetition pattern तयार करणे.
    - **प्रक्रिया:** Rectangular, Polar, Path array तयार करा.
    - **अपेक्षित परिणाम:** Objects repetition pattern नुसार arrange होतात.

15. **Xrefs वापरणे (External References)**
    - **उद्देश:** External references वापरून drawing manage करणे.
    - **प्रक्रिया:** दुसऱ्या drawing ला reference म्हणून attach करा.
    - **अपेक्षित परिणाम:** Drawing मध्ये external references अचूक दिसतात.
16. **Viewports, Zoom, Pan वापरणे**
    - **उद्देश:** Layout manage करणे.
    - **प्रक्रिया:** Layout मध्ये zoom, pan वापरून view manage करा.
    - **अपेक्षित परिणाम:** Layout मध्ये objects अचूक visible असतात.

प्रात्यफिकांची यादी: गट – II

एकक ४: 2D Drafting & Detailing

17. **Floor plan तयार करणे**

- **उद्देश:** इमारतीचा 2D floor plan तयार करणे.
- **प्रक्रिया:** Line, Polyline, Rectangle वापरून rooms, doors, windows रेखाटणे.
- **अपेक्षित परिणाम:** अचूक floor plan तयार होतो.

18. **Elevation आणि Section views तयार करणे**

- **उद्देश:** इमारतीचे elevation आणि section views तयार करणे.
- **प्रक्रिया:** Line, Polyline, Hatch वापरून views तयार करा.
- **अपेक्षित परिणाम:** अचूक elevation आणि section मिळतो.

19. **Furniture, doors, windows Detailing**

- **उद्देश:** Floor plan मध्ये furniture व अन्य घटक जोडणे.
- **प्रक्रिया:** Blocks, Hatch, Dimension वापरून घटक add करा.
- **अपेक्षित परिणाम:** Plan मध्ये घटक अचूक दिसतात.

20. **Schematic diagrams तयार करणे (Plumbing / Electrical)**

- **उद्देश:** Plumbing किंवा electrical layout तयार करणे.
- **प्रक्रिया:** Line, Polyline, Symbols वापरून schematic drawing तयार करा.
- **अपेक्षित परिणाम:** Plumbing / electrical layout अचूक तयार होतो.

एकक ५: 3D Modeling & Visualization

21. **3D Workspace आणि Coordinate system ओळख**

- **उद्देश:** 3D drawing आणि modeling साठी workspace समजणे.
- **प्रक्रिया:** 3D workspace select करा, coordinate system अभ्यासा.
- **अपेक्षित परिणाम:** विद्यार्थी 3D workspace मध्ये स्वतंत्रपणे काम करू शकतात.

22. **3D Solids तयार करणे (Box, Cylinder, Sphere, Cone, Wedge, Torus)**

- **उद्देश:** 3D objects तयार करणे.
- **प्रक्रिया:** Solid commands वापरून विविध shapes तयार करा.
- **अपेक्षित परिणाम:** अचूक 3D solids तयार होतात.

23. **3D Editing commands वापरणे (Union, Subtract, Intersect, Fillet, Chamfer)**

- **उद्देश:** 3D objects मध्ये modification करणे.
- **प्रक्रिया:** Commands वापरून 3D objects modify करा.
- **अपेक्षित परिणाम:** 3D objects योग्यरित्या बदललेले दिसतात.

24. **3D Surface आणि Mesh तयार करणे**

- **उद्देश:** Complex 3D modeling साठी surfaces व meshes तयार करणे.
- **प्रक्रिया:** Surface / Mesh commands वापरून objects तयार करा.
- **अपेक्षित परिणाम:** Complex 3D forms तयार होतात.

25. **Materials, Textures, Colors लागू करणे**

- **उद्देश:** 3D objects ला real appearance देणे.
- **प्रक्रिया:** Materials, Textures, Colors assign करा.
- **अपेक्षित परिणाम:** 3D objects visually realistic दिसतात.

26. **Lighting, Camera, Rendering सेट करणे**

- **उद्देश:** 3D visualization आणि presentation तयार करणे.
- **प्रक्रिया:** Lighting, Camera, Render setup करून rendered views तयार करा.
- **अपेक्षित परिणाम:** Professionally rendered 3D views तयार होतात.

एकक ६: Layout, Printing & Presentation

27. **Layouts आणि Title blocks तयार करणे**

- **उद्देश:** Drawing presentation तयार करणे.
- **प्रक्रिया:** Layouts तयार करा, title block insert करा.
- **अपेक्षित परिणाम:** Drawing presentation योग्यरित्या तयार होते.

28. **Scales आणि Viewports सेट करणे**

- **उद्देश:** Drawing सुसंगत scale मध्ये दाखवणे.
- **प्रक्रिया:** Viewports तयार करा आणि scale set करा.
- **अपेक्षित परिणाम:** Drawing scale योग्य असते आणि readable दिसते.

29. **Plotting / Printing drawings**

- **उद्देश:** Drawing paper किंवा PDF वर print करणे.
- **प्रक्रिया:** Plot command वापरून drawing print करा.
- **अपेक्षित परिणाम:** Drawing scale प्रमाणे paper वर print होतो.

30. **Drawings Export करणे (PDF, DWG, Image)**

- **उद्देश:** Drawing दुसऱ्या formats मध्ये save करणे.
- **प्रक्रिया:** Export किंवा Save As command वापरून PDF, DWG किंवा Image format मध्ये save करा.
- **अपेक्षित परिणाम:** Drawing विविध formats मध्ये उपलब्ध होते.

एकक ७: Mini Projects / Application Exercises

31. **Residential floor plan with furniture layout**

- **उद्देश:** पूर्ण apartment / house layout तयार करणे.
- **प्रक्रिया:** Floor plan रेखाटून furniture add करा.
- **अपेक्षित परिणाम:** अचूक residential floor plan तयार होतो.

32. **Mechanical part in 2D & 3D**

- **उद्देश:** Mechanical object चे 2D & 3D model तयार करणे.
- **प्रक्रिया:** 2D drawing करून 3D modeling करा.
- **अपेक्षित परिणाम:** Mechanical part चे accurate 2D & 3D model तयार होतो.

33. **Site plan / Landscape layout**

- **उद्देश:** Site किंवा landscape layout तयार करणे.
- **प्रक्रिया:** Plot, buildings, paths, trees add करा.
- **अपेक्षित परिणाम:** अचूक site / landscape plan तयार होतो.

34. **3D model of small building / pavilion with rendered views**

- **उद्देश:** Small building / pavilion चा 3D model तयार करणे.
- **प्रक्रिया:** 3D solids, surfaces, materials assign करा आणि rendered views तयार करा.
- **अपेक्षित परिणाम:** Professionally rendered 3D building model तयार होतो.

35. **Interior layout of living room / bedroom in 3D**

- **उद्देश:** Interior design visualization तयार करणे.
- **प्रक्रिया:** 3D room model तयार करा, furniture, materials, lighting add करा.
- **अपेक्षित परिणाम:** अचूक आणि visually realistic interior layout तयार होतो.

Course Outcomes:

Building Technology –

1. **Understanding Construction Principles:**
   Students will be able to identify various materials, techniques, and processes required for building construction.
2. **Knowledge of Building Materials:**
   Students will understand the **properties, uses, and limitations** of materials like bricks, cement, concrete, steel, timber, and other construction materials.
3. **Awareness of Construction Processes:**
   Students will gain **practical knowledge** of site planning, foundation, walls, roof, flooring, and other structural elements.
4. **Safety in Construction:**
   Students will be able to apply **safety standards, codes, and environmental considerations** during construction work.
5. **Technical Skills:**
   Students will become proficient in **tools, measurements, drawing, and design software** for construction applications.
6. **Quality and Maintenance of Construction:**
   Students will develop the ability to **identify defects, perform repairs, and maintain construction quality** effectively.

Interior Design –

1. **Fundamentals and Principles:**
   Students will learn **basic principles of space planning, color theory, lighting, and furniture arrangement**.
2. **Engineering and Aesthetic Understanding:**
   Students will be able to **create functional and visually appealing environments** in residential and commercial spaces.
3. **Knowledge of Materials and Finishes:**
   Students will understand **properties and proper use of wall finishes, flooring, ceilings, wood, fabrics, paints, and other interior materials**.
4. **3D Visualization and CAD Skills:**
   Students will be able to **prepare 3D models and presentations using AutoCAD, 3D Max, or equivalent software**.
5. **Standards, Safety, and Accessibility:**
   Students will incorporate **building codes, safety standards, accessibility, and environmental considerations** in their interior designs.
6. **Creativity and Problem-Solving Skills:**
   Students will develop **creative solutions for complex spatial problems**, combining functionality with aesthetics.

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part I (Building Technology and Interior Design)

NEP 2020 (2.0) Semester – I & II Nature of a Question Paper

Time: 1:00 Hr **Total Marks: 30**

Solve questions from the following.

Q. 1 Multiple choice Question **06 Marks**

i.

ii.

iii.

iv.

v.

vi.

Q. 2 Long answer Question (Any Two out of three **12 Marks**

i.

ii.

iii.

Q. 3 Short Answer Questions (Any Four out of six) **12 Marks**

i.

ii.

iii.

iv.

v.

vi.

Internal Assessment **20 Marks**

Home Assignment
Class Assignment (Tutorial Type) Quiz
Mid-Term Test

Nature of Practical Question Paper

Internal practical examination		**50 marks**
1.	Group I	20 Marks
2.	Group II	20 Marks
3.	Submission of Certified Journal	10 Marks

Assessment:

The NEP 2020 emphasizes upon formative and continuous assessment rather than summative assessment. Therefore, the scheme of assessment should have components of these two types of assessments. Assessment has to have correlations with the learning outcomes that are to be achieved by a student after completion of the course

a) **Continuous Assessment:** Assignments, projects, presentations, seminars and quizzes
b) **Examinations:** Midterm, finals, or comprehensive exams.
c) **Research Projects/Dissertation/Thesis:** Evaluated through submission and viva-voce
d) **Grading System:** Standardized letter grades, percentages, or CGPA

Letter Grades and Grade Points:

The Semester Grade Point Average (SGPA) is computed from the grades as a measure of the student's performance in a given semester. The SGPA is based on the grades of the current term, while the Cumulative GPA (CGPA) is based on the grades in all courses taken after joining the programme of study. The HEIs may also mention marks obtained in each course and a weighted average of marks based on marks obtained in all the semesters taken together for the benefit of students.

Computation of SGPA and CGPA: UGC recommends the following procedure to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)

Letter Grade	Grade Point
O (Outstanding)	10
A+ (Excellent)	9
A (Very Good)	8
B+ (Good)	7
B (Above Average)	6
C (Average)	5
P (Pass)	4
F (Fail)	0
Ab (Absent)	0

1. The SGPA is the ratio of the sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

$$\text{SGPA } (S_i) = \frac{\sum (C_i \times G_i)}{\sum C_i}$$

Where C_i is the number of credits of the i^{th} course and G_i is the grade point scored by the student in the i^{th} course.