

GUJARAT TECHNOLOGICAL UNIVERSITY (GTU)

**Competency-focused Outcome-based Green Curriculum-2021 (COGC-2021)
Semester - I**

CourseTitle: **Basic Design**
(Course Code: C4315004)

Diploma programme in which this course is offered	Semester in which offered
Architectural Assistantship	First

1. RATIONALE

In the field of Architecture, it is utmost important for one to communicate ideas graphically by stimulating the thinking process. It is therefore requiring to promote a creative and experimental methodology that helps to develop the learning style and cognitive skills of the learner with respect to fundamental principles of design. It is thus for this reason; this course has been introduced here to develop an artistic aptitude in learner to provide a strong platform that enable them to develop creative ideas for developing the better visual concepts in the discipline of architectural design. The course also forms the basis for free-hand drawing of object and building with application of principles of design. This course will be useful to the learner in architecture for various studio projects and later on architectural presentation in practice. In addition, the knowledge of different types of design skills enables the designers to design building with artistic forms.

2. COMPETENCY

The purpose of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

- **Apply principles of design for architectural creations using appropriate basic skill**

3. COURSE OUTCOMES (COs)

The practical exercises, the underpinning knowledge and the relevant soft skills associated with the identified competency are to be developed in the student for the achievement of the following COs:

- Apply the principles of sketching using various tools, materials to draw the elements of design such as point, line, plane, colours, etc.
- Apply design principles to create the relevant composition including finishes and textures
- Draw freehand sketches of a given object and from memory with light and shadow effects
- Prepare models of given geometrical shapes and compositions

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P/2)	Examination Scheme				Total Marks
L	T	P		Theory Marks		Practical Marks		
			C	CA	ESE	CA	ESE	
2	0	4	4	30*	70	25	25	150

(*): Out of 30 marks under the theory CA, 10 marks are for assessment of the micro-project to facilitate integration of COs and the remaining 20 marks is the average of 2 tests to be taken during the semester for the assessing the attainment of the cognitive domain UOs required for the attainment of the COs.

Legends: L-Lecture; T – Tutorial/Teacher Guided Theory Practice; P - Practical; C – Credit, CA - Continuous Assessment; ESE - End Semester Examination.

5. SUGGESTED PRACTICAL EXERCISES

The following practical outcomes (PrOs) that are the sub-components of the COs. Some of the PrOs marked ‘*’ are compulsory, as they are crucial for that particular CO at the ‘Precision Level’ of Dave’s Taxonomy related to ‘Psychomotor Domain’.

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. required
1	Draw different types of point and lines using various drawing materials	I	2
2	Draw different types of point and lines using various techniques	I	2
3	Prepare sketches incorporating the point and linear elements in given examples. (Min.2 Sketches)*	II	4
4	Prepare sketches incorporating the planar elements (Min.2 Sketches)*	II	4
5	Prepare sketches incorporating the Volumetric elements (Min.2 Sketches)*	II	6
6	Prepare transformation of form in given examples through sketches	II	4
7	Draw a colour wheel indicating colour schemes	II	4
8	Prepare geometrical composition (2D) using Design Principles and various media (Min. 2 Sketches)*	III	6
9	Prepare colour compositions incorporating colour schemes. (Min. 2 Sketches)	III	6
10	Prepare freehand sketches of objects and furniture. (Min. 3 Sketches)	IV	4
11	Prepare freehand sketches of building elements (Min. 3 Sketches)	IV	4
12	Prepare Indoor & Outdoor sketches for real life situation (Min. 3 Sketches)*	IV	4
13	Prepare sketches and models of geometrical composition (3D) having 4 to 5 geometrical solids*	V	6
Total			56

Note

- i. More **Practical Exercises** can be designed and offered by the respective course teacher to develop the industry relevant skills/outcomes to match the COs. The above table is only a suggestive list.

ii. The following are some **sample** 'Process' and 'Product' related skills that occur in the above listed **Practical Exercises** of this course required which are embedded in the COs and ultimately the competency.

S. No.	Sample Performance Indicators for the PrOs	Weightage in %
1	Comprehend: Demonstrations that instruction and concepts are understood	20
2	Craftsmanship/ Skill: Neatness, precision, perfection, etc.	20
3	Creativity/ Originality: Inventiveness, expression of ideas and imagination	20
4	Dedication: What it takes to finish the project as well as devoted time dedicated to the project both inside and/or out of class	20
5	Cooperation: Attitude during class time; willingness to complete set up, art practice and clean up tasks	20
Total		100

The above table is only a suggestive list. The respective course teacher can develop the performance indicators for the PrOs before given **Practical Exercises**.

6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

These major equipments with broad specifications for the PrOs is a guide to procure them by the administrators to usher in uniformity of practical in all institutions across the state.

S. No.	Equipment Name with Broad Specifications	PrO.No.
1	Portable A1 or A2 Drawing Board, A Metal Ruler With A Cutting Edge. Black Lead Drawing Pencils in HB to 4B, Charcoal, Various Pens For Sketching i.e Fineliners, Felt Tips & Coloured Markers. Sketchbooks In A5, A4 & A3 Sizes. Colour i.e Pencil and water colour etc.	1 to 13

7. AFFECTIVE DOMAIN OUTCOMES

The following **sample** Affective Domain Outcomes (ADOs) are embedded in many of the above-mentioned COs and PrOs. More could be added to fulfil the development of this course competency.

- a) Work as a leader/a team member
- b) Follow ethical design practices
- c) Originality in thought process and implementation of ideas

The ADOs are best developed through the laboratory/field-based exercises. Moreover, the level of achievement of the ADOs according to Krathwohl's 'Affective Domain Taxonomy' should gradually increase as planned below:

- i. 'Valuing Level' in 1st year
- ii. 'Organization Level' in 2nd year.
- iii. 'Characterization Level' in 3rd year.

8. UNDERPINNING THEORY

The major underpinning theory is given below based on the higher level UOs of Revised Bloom's taxonomy that are formulated for development of the COs and competency. If required, more such UOs could be included by the course teacher to focus on attainment of COs and competency.

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
Unit – I Introduction to Basics of sketching with various tools and materials	1a. Carryout free hand sketching using different tools and techniques.	1.1 Introduction to sketching tools and materials - Drawing and sketching tools and materials such as Pencil, Pen, Ink pen, Pencil colours, Sketch pen, Felt tip pen, Markers, Water colour, Pastel colour, Acrylic colour, Charcoal pencil/chalk, Brush, Crayon wax, Drawing sheets/paper, Drawing book, Drawing board, etc. 1.2 Sketching Techniques – Stippling, Scribbling, Circling, Smooth Shading & Blending, Creating Highlights and Rendering
Unit – II Elements of Design	2a. Draw the given types of point elements and linear elements 2b. Draw the given types of Planar and volumetric elements 2c. Analyze architectural Form in given examples through sketch (pl check) 2d. Prepare sketches using relevant types of form and transformation of the given form (pl check) 2e. Prepare colour wheel, colour texture and colour schemes for a given situation.	2.1 Point elements- Dots 2.2 Linear elements- Line: Definition of line, Different types of line, Aspects of line, its physical and psychological effects on human figure. (Horizontal, Vertical, Diagonal, Curved, Zigzag) 2.3 Planar elements- Primary shapes, Regular and irregular 2.4 Volumetric elements - Properties of Form, Types of form: Centralized, Linear, Radial, clustered, gridform, Transformation of form 2.5 Colour and Texture - Colour wheel, colour schemes, Texture etc. (etc. should not be there)
Unit – III Principles of Design and 2D Composition	3a. Explain Design and ordering principles. 3b. Create 2D geometrical composition using elements and principle of design	3.1 Design Principles - Representation techniques focusing on Axis, Symmetry, Hierarchy, Harmony, Balance, Emphasis, Rhythm, Scale, Proportion, Repetition, etc. 3.2 2D Geometrical Composition using elements and principles of

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
		design with tone & texture, figure & ground, colour and shading, etc.
Unit– IV Freehand sketching	4a. Draw freehand sketches of a given furniture and building elements 4b. Draw the freehand sketches from memory 4c. Prepare sketches of interior spaces 4d. Prepare sketches of built forms	4.1 Live Object Drawing- Furniture, Part of Building i.e Door, Windows, Gate, Arch, Dome etc. 4.2 Freehand sketches from memory – Memory Sketching 4.3 Indoor & Outdoor sketching - Basic free-hand Perspective drawing for interior of rooms- Foyer, Living Room, Kitchen, Bedroom, View from balcony, Garden, Campus, Worm’s Eye View, Bird’s Eye View, etc.
Unit– V Model Making and 3D Composition	5a. Prepare models of a given geometrical object using different types of materials such as clay, card board etc. 5b. Prepare models of 3D geometrical compositions using elements of design 5c. Prepare sketches from various angles	5.1 Models of geometrical objects using Clay, Thermocole sheet, Card board, Paper, Wire, Wood, etc. 5.2 Composition of Models - 3D Geometrical Composition using elements of design and sketch with light & shade, figure & ground, colour and shading, etc.

9. SUGGESTED SPECIFICATION TABLE FOR QUESTIONPAPER DESIGN

Unit No.	Unit Title	Teaching Hours (L+P=Total)	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction to Basics of sketching with various tools and materials	4	4	2	4	10
II	Elements of Design	8	4	6	10	20
III	Principles of Design & 2D Composition	8	4	6	10	20
IV	Freehand sketching	4	1	3	6	10
V	Model Making and 3D Composition	4	1	3	6	10
Total		28	14	20	36	70

Legends: L=Lecture; T – Tutorial/Teacher Guided Theory Practice; P -Practical; R=Remember, U=Understand, A=Apply and above (Revised Bloom’s taxonomy)

Note: This specification table provides general guidelines to assist student for their learning and to teachers to teach and question paper designers/setters to formulate test items/questions assess the attainment of the UOs. The actual distribution of marks at

different taxonomy levels (of R, U and A) in the question paper may vary slightly from above table.

10. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related **co-curricular** activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

- a) Visit of historical sites and draw sketches of monuments and surroundings
- b) Organize interactive sketching workshops.
- c) Visit of art exhibitions.
- d) Undertake micro-projects for Composition
- e) Organize seminar on design/ordering principle
- f) Prepare portfolios of Basic Design sketching and drawing.
- g) Prepare power point on model making technologies

11. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

- a) Massive open online courses (**MOOCs**) may be used to teach various topics/sub topics.
- b) Guide student(s) in undertaking micro-projects.
- c) '**L**' in **section No. 4** means different types of teaching methods that are to be employed by teachers to develop the outcomes.
- d) About **20% of the topics/sub-topics** which are relatively simpler or descriptive in nature is to be given to the students for **self-learning**, but to be assessed using different assessment methods.
- e) With respect to **section No.10**, teachers need to ensure to create opportunities and provisions for **co-curricular activities**.
- f) Guide students on how to address issues on freehand sketching, model making etc.
- g) Guide students for using relevant ordering principle.
- h) Use video/animation films to explain various basic design concepts/processes related to Architectural Design themes.
- i) Use different instructional strategies in classroom teaching.

12. SUGGESTED MICRO-PROJECTS

Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her in the beginning of the semester. In the first four semesters, the micro-project is group-based. However, in the fifth and sixth semesters, it should be preferably be **individually** undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. In special situations where groups have to be formed for micro-projects, the number of students in the group should **not exceed three**.

The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. Each student will have to maintain dated work diary consisting of individual contribution in the project work and give a seminar presentation of it before submission. The total duration of the micro-project should not be less than **16 (sixteen) student engagement hours** during the course. The student ought to submit micro-project by the end of the semester to develop the industry-oriented COs.

A suggestive list of micro-projects is given here. This has to match the competency and the COs. Similar micro-projects could be added by the concerned course teacher:

- a) Document the historical building through sketching.
- b) Document the campus activity through the outdoor sketching.
- c) Prepare photography portfolio displaying elements of design in architecture.
- d) Prepare photography portfolio displaying principles of design in architecture.

13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication with place, year and ISBN
1	Architecture: Form, Space and Order	Francis D.K.Ching	John Wiley & Sons, Inc. New York ISBN:0471286168 ISBN: 978-1-118-74508-3 (4 th Edition, 2014)
2	Architecture in Pen and Ink	John Chen	McGraw-Hill, Inc. New York, October 1994 Edition. ISBN-13: 978-0070110793 ISBN-10: 0070110794
3	Rendering with Pen & Ink	Frank Allison Hays	Architecture Book Pub. Co./latest ISBN-10: 1274236975 ISBN-13: 978-1274236975
4	A Visual Dictionary of Architecture	Francis D.K.Ching	John Wiley & Sons, Inc. New York ISBN:0471286168 ISBN-10:111816495
5	Design Drawing	Francis D.K.Ching with Steven P.Juroszek	John Wiley & Sons, Inc. New York ISBN:1119508592, 9781119508595
6	How to Draw: Drawing and Sketching Objects and Environments from Your Imagination	Scott Robertson, Thomas Bertling	Design Studio Press ISBN:9781933492735, 1933492732

14. SOFTWARE/LEARNING WEBSITES

- www.nptel.iitm.ac.in
- www.khanacademy
- <https://in.pinterest.com>
- <https://swayam.gov.in>
- www.strathmoreartist.com

15. PO-COMPETENCY-CO MAPPING

Semester I	Basic Design (Course Code:C4315004)								
	POs and PSOs								
Competency & Course Outcomes	PO 1 Basic & Discipline specific knowledge	PO 2 Problem Analysis	PO 3 Design/development of solutions	PO 4 Engineering Tools, Experimentation & Testing	PO 5 Engineering practices for society, sustainability & environment	PO 6 Project Management	PO 7 Life-long learning	PSO 1*	PSO 2#
Competency	Apply principles of design for architectural creations using appropriate basic skill.								
a) Apply the principles of sketching using various tools, materials to draw the elements of design such as point, line, plane, colours, etc.	3	-	-	2	-	-	2	1	-
b) Apply design principles to create the relevant composition including finishes and textures	3	1	2	-	-	-	2	1	-
c) Draw freehand sketches of a given object and from memory with light and shadow effects	3	1	3	-	-	-	3	1	1
d) Prepare models of given geometrical shapes and compositions	3	-	2	2	-	-	2	2	-

Legend: '3' for high, '2' for medium, '1' for low and '-' for no correlation of each CO with PO/PSO.

*PSO 1: Prepare architectural designs and all types of drawings with appropriate material specifications and application techniques as per specific project requirements.

#PSO 2: Work competently as assistants in architectural firms so as to contribute and coordinate both office work and execution on site.

16. COURSE CURRICULUM DEVELOPMENT COMMITTEE

GTU Resource Persons

S. No.	Name and Designation	Institute	Contact No.	Email
1	Shri Bhaskar J. Iyer, HOD, Coordinator & Associate Dean	Government Polytechnic for Girls, Ahmedabad	9879474833	bhaskariyer2004@gmail.com
2	Shri Bhavesh M. Patel, Lecturer	Government Polytechnic for Girls, Ahmedabad	9427462830	bhavesh0arch222@gmail.com
3	Ms. Arpita M Mistry, Lecturer	Government Polytechnic for Girls, Surat	9712938971	arpitamistry89@gmail.com

S. No.	Name and Designation	Institute	Contact No.	Email
4	Ms. Sefali H. Brahmhatt, Lecturer	Government Polytechnic for Girls, Ahmedabad	9016612347	Sefalibrahmbhatt @yahoo.co.in
5	Ms. Mrigaya H. Desai, Lecturer	Government Polytechnic for Girls, Surat	8469444555	mrigaya.desai @gmail.com

NITTR Resource Persons

S. No	Name and Designation	Department	Contact No.	Email
1	Dr. V.D. Patil, Associate Professor & Coordinator for AA Discipline	Civil & Environmental Engineering Education	9422346736	vdpatil@nittrbpl.ac.in
2	Dr. Subrat Roy, Professor & Co-coordinator for AA Discipline	Civil & Environmental Engineering Education	7869529500	sroy@nittrbpl.ac.in