GUJARAT TECHNOLOGICAL UNIVERSITY (GTU)

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

Course Title: Architectural Design for Public Building
(Course Code: 4335001)

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

1. RATIONALE

Architectural design is the core course of this programme. Public Building Design is in continuation with the course 'Advanced Architectural Design' offered in the Second Semester. In this course, the knowledge and appropriate application of the relationship between form & space enables the learner to design multiple-volume buildings with relation to each other for public needs and for given site situation. Knowledge about architectural spaces - both built & open and their use allows them to create functional hierarchy within the site. Knowledge about interlocking spaces & spaces linked by a common space helps the learner in spatial organization on site. Knowledge of repetitive spaces, radial spaces & clustered spaces help the learner to functionally organize a layout. Knowledge of disciplines of structure, design parameters, spatial order helps them create co-relation between space–structure. Understanding about environmental concerns, energy efficiency and structural systems as applicable to kinds of building enables the learner to comprehend how a building practically stands and functions in particular environmental situation. Knowledge of different types of openings and their locations in a building with respect to climate helps them to design suitable architectural elements. The purpose here is also to hone the respective skill-sets of the learners to enable them to approach ensuing design complexities in a strategic way to address their architectural representation capacity for conveying different ideas. Presentation drawings & models help in visualizing and comprehending the overall form and function of given projects.

2. COMPETENCY

To familiarize the learners with various **Public Building** projects, their design approaches, methods, principles and techniques of design and attain industry identified competency through various teaching learning experiences:

- **Prepare architectural design for a public building based on different architectural design parameters, its presentation drawings and models**

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 learner for the achievement of the following COs:

a) Analyze the collected primary and secondary data of existing public building considering the given parameters.
b) Prepare an architectural design for the public building as per given requirements and site situation.

c) Prepare a set of architectural presentation drawings for the designed public building along with its model and sketches to appropriate scale.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P/2)	Examination Scheme				
				Theory Marks		Practical/Studio Marks		Total Marks
L	T	P/S	C	CA	ESE	CA	ESE	
0	0	12	6	00	00	50	50	100

*(*): For this practical/studio only course, 50 marks under the practical CA should be done by assessment of process of designing a public building with all design parameters. This is designed to facilitate attainment of COs holistically. Thus, this course should be considered as an **Applied 'Theory' Course** where the theory portion has to be taught during the practical/studio hours.*

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

5. SUGGESTED PRACTICAL/STUDIO EXERCISES

The following practical outcomes (PrOs) are the sub-components of the COs. T*hey 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	**Collect Primary Data:** Collect data of an existing public building like Circulation plan, Floor Plans, sections, elevations and furniture layout with indoor outdoor connectivity, space organization etc. to an appropriate scale to analyze the same with **design parameters, land-building relationship, environmental and energy efficiency concerns.** **Collect Secondary Data**: Collect similar data of an existing public building From Books, Magazines, Internet, etc.	I	12
2	Graphical analysis and comparison of similar type of Public Building with respect to all architectural design parameters like area, light ventilation, form, space, circulation, structure, skin and indoor-Outdoor connectivity. Preparation of pie charts, sketches and their **appraisal.** Then formulation of requirements for proposed design project.	I	12
3	Prepare flow diagram, conceptual drawing like sketch design, block models, site plan, floor plans, elevations, sections and Sketches for the given Public Building Project including environmental and energy efficiency parameters.	II	24
4	Prepare Set of design drawing based on the given requirements with considerations of principles of design, relationship between human feelings and architectural form	III	24
5	Prepare site Layout with parking, Circulation and other outdoor site features	III	12

6	Prepare furniture layout for the designed building	III	12
7	Prepare a set of final presentation drawings including all given parameters in plans, sections, elevations and internal views for the designed building	IV	48
8	Draw an axonometric/isometric/perspective view of the designed building	IV	12
9	Make a model of the designed project to scale	IV	12
	Total Hrs.		**168**

Note

*i. More **Practical/Studio 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. Study report, data collection and analysis report must be assigned in a group. Teacher has to discuss about type of data (which and why) before group start their site visits.

*iii. The following are some **sample** 'Process' and 'Product' related skills (more may be added/deleted depending on the course) that occur in the above listed **Practical/Studio Exercises** of this course required which are embedded in the COs and ultimately the competency.*

Sr. No.	Sample Performance Indicators for the PrOs	Weightage in %
Assessment should be done on the basis of demonstration of,		
1	Skills	25
2	Learning Process	25
3	Communication	25
4	Learning Attitude	25
Total		**100**

6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

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

S. No.	Equipment Name with Broad Specifications	PrO.No.
1	Measuring Tape, Laser measure tape, Drawing Sheets, Tracing papers	1-9
2	Drawing Board (A1 size @ 23"X32") with other Other Instruments like Parallel, Set squares (45˚ and 30˚-60˚), Adjustable set square, Triangular scale, Tracing papers, Drawing Sheets	1-9
3	Interactive board with LCD overhead projector	1-9
4	Desktop PCs with latest configuration	1-9

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 competency.

a) Work as a leader/a team member.
b) Follow ethical practices.
c) Social and Functional Competence of design
d) Participates in class discussions and present the design effectively, Generate new ideals.
e) Practice environmentally friendly methods and design processes.

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 **Primary and Secondary Data collection**	**1a.** Collect/Prepare primary data of existing public buildings like circulation plan, floor plans, sections, elevations, furniture layout and related drawings while secondary data from books, journals, magazines, internet, etc. **1b.** Graphically analyze collected data of existing public building with respect to all architectural design parameters like area, lighting & ventilation, form, space design, circulation, structure, façade and inter-connectivity. **1c.** Formulate design requirements for the given design project.	**1.1 Introduction to existing public building** designed like Library, Primary/Secondary School, Old Age Home, community centers, Urban Health Centers, sport training center etc. (Or any other appropriate public building project apart from the above). • **Primary data collection:** With the help of site visit/visits, existing public building, take measurements and prepared drawings, photos, sketches, etc. • **Secondary Data Collection**: Collection of data from books, magazines, internet, etc. **1.2 Formulation of requirements**
Unit– II Development of Concept and locating the building on site	**2a.** Prepare conceptual alternatives for design considering various design parameters for further development of given project **2b.** Develop the conceptual alternatives with functional land-building relationship diagram based on requirements	Design development parameters **2.1 Design Requirements** : Application of inferences from primary and secondary data collection **2.2 Conceptual Design** : Graphical representation of functional co-relationships between given requirements – Bubble Diagram **2.3 Derivation of Form** : Derivation of a form with regard to functional requirements by developing activity-space relationship

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
		2.4 Building orientation on site with respect to - Form & Space, Margins, Wind direction, Natural light & ventilation, Openings, Qualities of architectural space, Structural system **2.5 Land-building relationship** principles for creating a hierarchy of spaces with reference to Site topography, Site surroundings, Climatic considerations
Unit – III Preparing Sketch Design	**3a.** Use spatial ordering principles for the given building project. **3b.** Prepare improved sketch design with respect to light, space and form.	**4.1 Order of spaces** based on organizing principles like Axial, Symmetrical, Clustered, Grid, Centralized, Linear **4.2 Two-Dimensional Graphical Representation**: Development of plan, sections, elevations in sketch form with spatial relationships **4.3 Environmental concerns and energy efficiency** Development of design considering parameters like environment and energy efficiency **4.4 Light, space and form** as essentials of architecture **4.5 Materials and Finishes**: Development of elevations and sections with consideration of levels as well as building materials
Unit – IV Design & Development of Drawings	**4a.**Develop the sketch to an appropriate scale as per requirements of building **4b.** Develop the sketch showing elevations, massing in relationship to exterior spaces **4c.** Draw the necessary 3D building drawings to scale. **4d.** Prepare a block study model of the designed house as well as the site layout	**4.1. Development** of floor plans, sections, elevations and spatial relationships at appropriate scale **4.2. Development** of elevations and sections with respect to building finishes fenestrations and levels **4.3 Development** of site layout with road network and landscaping **4.4. Axonometric/isometric view** of the designed building as well as of the site layout
Unit – V Space – Activity Relationship	**5a.** Prepare furniture layout drawings for the designed units **5b.** Prepare complete site layout drawings with unit locations, roads, common spaces and amenities, parking and landscaping	**5.1 Furniture Layout** drawings for various activities / functions of the house based on given requirements **5.2 Site layout** drawing for various activities/functions based on given requirements

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
Unit – VI Final Presentation of Drawings and Models	**6a.** Prepare a set of final presentation drawings including all of the above. **6b.** Make a model of the designed project to a suitable scale with surroundings.	**6.1.** Final presentation drawings with rendering **6.2.** Preparation of a model

9. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Primary and Secondary Data collection	**Not Applicable**				
II	Development of Concept and locating the building on site					
III	Preparing Sketch Design					
IV	Design & Development of Drawings					
V	Space – Activity Relationship					
VI	Final Presentation of Drawings and Models					
Total						

Legends: *R=Remember, U=Understand, A=Apply and above (Revised Bloom's taxonomy)*

Note*: This specification table provides general guidelines to assist learners for their learning and to teachers to teach and question paper designers/setters to formulate test items/questions to 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 slightly vary from above table.*

10. SUGGESTED LEARNER ACTIVITIES

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

a) Undertake periodic site visits to relate to the present architectural practices.
b) Identify and explore the design parameters for the locally available Public buildings.
c) Attend Interactive sketching workshops.
d) Visit and explore art exhibitions and libraries
e) Give seminar on the relevant topic under consideration.
f) Prepare portfolio of Architectural Design for Public Buildings
g) Participate in model making workshops

The practical/exercises should be properly designed and implemented with an attempt to develop different types of practical skills (Course Outcomes in psychomotor and affective domain) so that

learners are able to acquire the competencies (Programme Outcomes). Following is the list of practical exercises for guidance.
Note: Here only Course Outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of Programme Outcomes/Course Outcomes in affective domain as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that learners also acquire those Programme Outcomes/Course Outcomes related to affective domain

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 learner(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 learners 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 learners on how to address issues on sketching, model making, etc.
g) Use relevant video/animation films to explain various concepts and processes related to basic Architectural design themes for Public Buildings.
h) Use different instructional strategies in classroom teaching.
i) Use the relevant architectural assignments in the given situation.
j) Guide learners on form, functions utility, method of construction, etc. to facilitate them to prepare actual measured drawings.
k) Use the technique of table top discussions along with design jury sessions to teach the relevant content to the learners.
l) Adopt various strategies to enhance each learner's individual creative ability especially with reference to concept and form

12. SUGGESTED DESIGN MICRO-PROJECTS

Only one micro-project is planned to be undertaken by a learner that needs to be assigned to him/her in the beginning of the semester. In the first four semesters, the micro-project are group-based (group of 3 to 5). However, **in the fifth and sixth semesters**, the number of learners 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 learner 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 duration of the microproject should be about **14-16 (fourteen to sixteen) learner engagement hours** during the course. The learners 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 Co. Similar micro-projects could be added by the concerned course teacher:

a. Undertake an **Architectural Apprenticeship** to gain practical exposure of the actual on-going projects.
b. Undertake a design project in consultation with the teacher.

13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication with place, year and ISBN
1	Principles of three Dimensional Design	Wucius Wong	New York, Van Nostrand Reinhold Co., 1977. ISBN : 0442295618 9780442295615 1 March 1977
2	Time Saver Standards for Architectural Design	Michael Crosbie), Donald Watson	McGraw Hill Education; ISBN-10. 9781259002892 ISBN-13. 978-1259002892 8th edition (1 July 2017)
3	Daylighting – Natural light in Architecture	Derek phillips	Architectural press An Imprint of Elsevier, Burlington ISBN 0750663235 First Publication 20041
4	Visual Dictionary of Architecture	Francis D.K.Ching	John Wiley & Sons, United States ISBN-10 : 8126535644 ISBN-13 : 978-8126535644, Second edition (23 April 2012)
5	Architecture - Form, Space & Order	Francis D.K.Ching	John Wiley & Sons, United States **ISBN-10 :** 047023153X **ISBN-13 :** 978-0470231531 3rd Edition Set (25 September 2007)
6	Neufert, Architects' Data	Ernst Neufert	Wiley-Blackwell, United Kingdom ISBN-10 : 111928435X ISBN-13 : 978-1119284352, 5th edition (12 July 2019)
7	Contemporary Indian Architecture- After the Masters	Bhatt Vikram, Peter Scriver	Grantha Corporation - 1 January 1999 **ISBN-10 :** 0944142192 **ISBN-13 :** 978-0944142196
8	Architecture + Design	Journal/Magazine	Burda Media India ISSN: 0970-2369
9	Inside Outside	Journal/Magazine	Business India Group ISSN: 0970-1761
10	Indian Architect and Builder	Journal/Magazine	Jasubhai Media Pvt. Ltd. ISSN:0971-5509
11	David Adjaye: Making Public Buildings	Thames & Hudson	Garden Grove, California ISBN 10- 0500342245

S. No.	Title of Book	Author	Publication with place, year and ISBN
			ISBN 13- 9780500342244

14. SOFTWARE/LEARNING WEBSITES

- www.greatbuildings.com
- www.architecturalrecord.com
- www.archdaily.com
- www.dezeen.com
- www.archpaper.com
- www.architectmagazine.com
- www.archello.com
- www.designboom.com

15. PO-COMPETENCY-CO MAPPING

Semester I	Architectural Design Fundamentals (Course Code: 4315001)								
	POs and PSOs								
Competency & Course Outcomes	PO 1 Basic & Discipline specific knowledge	PO 2 Problem Analysis	PO 3 Design/ develop-ment of solutions	PO 4 Engineer-ing Tools, Experimentation &Testing	PO 5 Engineer-ing practices for society, sustain-ability & environ-ment	PO 6 Project Manage-ment	PO 7 Life-long learning	* PSO 1 Planning & Design	#PSO 2 Execu-tion
Competency	Prepare architectural design for a public building based on different architectural design parameters, its presentation drawings and models								
Course Outcomes a) Analyze the collected primary and secondary data of existing public building considering the given parameters	3	1	-	2	1	-	2	1	-
b) Prepare an architectural design for the public building as per given requirements and site situation.	3	2	2	1	2	1	2	2	2
c) Prepare a set of architectural presentation drawings for the designed public building along with its model and sketches to appropriate scale.	3	3	3	1	1	2	2	3	2

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

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

#PSO 2: Execution: 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

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