

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM COURSE TITLE: WORKING DRAWINGS* (COURSE CODE: 3355001)

Diploma Programme in which this course is offered	Semester in which offered
Architectural Assistantship	5 th Semester

1. RATIONALE

The knowledge and skill of preparing working drawings is very essential for an architect. Designing a building is one thing and proper knowledge of actual execution of the same on site is another. Working drawings are essentially prepared for actual construction of a designed building. Working drawings consist of basic drawings and detailed drawings. The basic set includes all plans, sections & elevation with accurate dimensions while the detail drawings include enlarged details of kitchen, toilets, doors & windows, staircase etc with accurate dimensions. A foundation plan and line out drawing with centre-line dimensions which is part of the basic set of drawings is essential for the line-out of the building on site. Most importantly, the architect gets a opportunity to apply all his knowledge and creative skills for working out architectural details as a part of detail drawings. All finishes are also specified in these details drawings. These drawings also include all dimensions including wall thickness, heights, levels etc. All these put together facilitate in constructing the building on site exactly according to its design. Thus working drawings help site engineers to understand how a building is actually constructed on site. Thus it is important for students to learn to prepare the working drawings as it is the core ability required for architectural assistantship. This course is designed in view of above outlook and for developing the competency mentioned below, accordingly.

2. LIST OF COMPETENCY

The course content should be taught and curriculum should be implemented with the aim to develop required skills in students so that they are able to acquire following competencies:

- **Prepare all basic working drawings including site layout and all plans, elevations and sections of a given building**
- **Prepare all detailed working drawings with all specifications and finishes for the given building**

3. COURSE OUTCOMES

The applied theory for this course should be taught and practical should be carried out in such a manner that students are able to acquire required learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes. Students will be able to

- i. Prepare basic working drawings for a given building specification
- ii. Prepare site layout with necessary details based on basic drawings
- iii. Prepare detailed working drawing based on basic drawings
- iv. Incorporate the knowledge of construction, finishes and services for designing details and preparing working drawings
- v. Use CAD software for preparation of basic working drawings.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks
				Theory Marks		Practical/Studio Marks		
L	T	P	C	ESE	PA	ESE	PA	300
0	0	12	12	00	00	100	200	

Legends: L-Lecture; T- Tutorial/Teacher guided theory Practice, S- Studio; P - Practical; C – Credit; ESE - End Semester Examination; PA - Progressive Assessment

NOTE: Progressive Assessment evaluation should be supported by the academic documentation

5. COURSE CONTENT DETAILS

NOTE: There are no separate classes for theory and this theory should be discussed in the studio before relevant practical exercise.

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – I Design development and its finalization for working drawings	1a. Select a building unit/s from previous semester's housing design project or select any given building unit for preparing a complete set of working drawings 1b. Develop the design of the selected/given building unit with respect to materials of construction and finishes. 1c. Finalize the structure of the building (With the help of a structural consultant or applied mechanics faculty of your institute), e.g. wall thicknesses in case of load bearing structure and approximate column locations and their sizes in case of frame structure 1d. Draw all the drawings to a scale of 1:50 or any convenient scale	1.1 Introduction and study of working drawings of housing projects as follows, <ul style="list-style-type: none"> • Study of a set working drawings prepared by a practicing architect • Study of 'Working Drawings' prepared by students of Architecture degree & diploma colleges through students visits and/or presentations by experts from both industry and other institutes • Site visits to on-going housing construction sites • The basic building unit drawings should be drawn to appropriate scales e.g. 1:50 or 1:100 (not odd scales like 1:40 or 1:75). However such decisions are best left at the discretion of concerned faculty members.
Unit– II Preparation of site layout with necessary details	2a. Draw the site layout to a scale of 1:200 or any appropriate scale. 2b. Prepare a detailed layout plan showing all housing units and mark out the housing unit selected for working drawings separately (should be removed – great degree of details will be required, distances amongst all units, compound walls, common plot etc this will make it more complex) 2c. Prepare a site drainage and water supply plan	2.1 Site layout including building units, roads and landscaped areas drawn clearly without rendering. 2.2 The drawing format for preparing working drawings, standardized, complete with borderline, notes, revision table and name-plate. 2.3 Draw essential site details like compound wall section, UGWT any one landscape / hard paving detail

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – III Preparation of all Basic Drawings	3a. Draw plans at all levels 3b. Draw all elevations 3c. Draw all sections 3d. Develop all the basic drawings with all necessary dimensions, levels, material finishes, specifications and notes 3e. Cross-check all plans, elevations and sections for any missing architectural element or detail and rectify the same if necessary. 3f. Draw all the above drawings in a standard drawing format	3.1 All plans (as applicable), <ul style="list-style-type: none"> • Foundation Plan • Grid Plan • All Floor Plans • Terrace Plan 3.2 All elevations include (as applicable), <ul style="list-style-type: none"> • North elevation • South elevation • West elevation • East elevation • Any other 3.3 All sections include (as applicable), <ul style="list-style-type: none"> • Minimum one section through toilets • Minimum one section through staircase • Minimum two other sections (Note: Sections should be drawn with the aim to show all the details of the designed building and hence should be cut accordingly)
Unit – IV Preparation of all Detail Drawings	4a. Draw all the detail drawings in a standard drawing format 4b. Write specifications, notes and instructions wherever necessary 4c. Specify the make, sizes and specifications of all materials, fixtures and finishes on the drawing	4.1 All detailed drawings including at least the following, <ul style="list-style-type: none"> • Toilet details • Kitchen details • Door/Window details • Staircase details • Railing details • Flooring details • Electrical layout • House Drainage Layout • Any other 4.2 All detailed drawings should be drawn to a scale of 1:20 or 1:25. However some of the more intricate details should be drawn to an appropriate enlarged scale. 4.3 All details designed and worked out individually by the students under the guidance of the faculty. Detail drawings should be co-related with the basic drawings before finalization.
Unit – V Drawing all working drawings on computer	5a. Draw all the basic drawings on computer with the help of CAD software. However preparing all detail drawings with CAD is best left at the discretion of concerned faculty member and should be considered optional. 5b. Document the entire set of working drawings.	5.1 Use the latest version of CAD software to prepare working drawings 5.2 Documentation of the entire set of working drawings should be done with the aim of presenting the same for securing placement for Office Training in Sixth Semester

6. SUGGESTED LIST OF EXERCISES/PRACTICALS/STUDIO WORK

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills (**outcomes in psychomotor and affective domain**) so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

*Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of **Course Outcomes** related to affective domain. Thus over all development of **Programme Outcomes** (as given in a common list at the beginning of curriculum document for this programme) would be assured.*

Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes.

S. No.	Unit No.	Practical/ Exercises (outcomes in psychomotor domain)	Approx Hours Required
1	I	Design and develop plan for given buildings specification and its finalization for working drawings	12
2	II	Prepare site layout with necessary details for given buildings specification	24
3	III	Prepare all Basic Drawings for given building specification	60
4	IV	Prepare all Detail Drawings for given buildings specification	48
5	V	Drawing all basic working drawings on computer for given buildings specification	24
TOTAL			168

7. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities like: interactive group discussions, course/topic based seminars, internet based assignments, teacher guided self learning activities, course/library/internet based studies, studying e-brochures of various materials, etc. These could be individual or group-based.

Suggested individual activities to be performed under the guidance of architecture faculty, are as follows,

- i. Study of a complete set of both basic and detail working drawings of a building prepared by,
 - Practicing architect / Architectural firm
 - Students of architecture degree institutes / other diploma institutes offering the same course
- ii. Study and documentation of construction and architectural details of a building under construction

Suggested group-based activities which can be conducted within the state are,

- i. Visits to Architecture degree/diploma institutes for studying and knowledge-sharing on documented/on-going students' **'Working Drawing Studio'** works
- ii. Visits to practicing architects' offices and residential building townships, construction sites, etc. to study and co-relate 'Working Drawings' and actual construction work. All relevant data should be collected for both study and documentation work by students.
- iii. Visits to architectural material, finishes and fixtures vending stores/shops/showrooms for studying and understanding their applications/uses, e.g. for sanitary fixtures, electrical fixtures, flooring materials, modular kitchens, etc.

Note: The study of this course is to be undertaken by the student as a unique opportunity to study and understand the best practices followed in the field of architecture and building construction. Hence the above-mentioned activities are to be initiated and undertaken by the student himself and perform them under the guidance of his/her faculty.

8. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

- i. This subject has theory component that is taught during practical classes so as to develop and encourage subject related skills. For this each student needs to be attended to, by the concerned faculty individually and hence this subject should be treated as a **“studio”** subject.
- ii. Concerned faculty member is expected to provide continuous guidance as well as all necessary support and feedback to the students in the working drawing studio/lab to the students when are working on their drawings.
- iii. However, the concerned faculty member has the freedom to undertake any activity during the design studio hours which is related to this course and is beneficial to the students for learning and for further improving their studio work. These activities can be site visits, visits to architect's offices and arrangement of expert lectures and/or guest faculty for this course.

9. SUGGESTED LEARNING RESOURCES

A. List of Books

Sr. No.	Title of Book/Journals	Author	Publication
1.	100 Of The World's Best Houses	Slessor	Images Publ.
2.	200 Houses	Cleary	Images Publ.
3	21st Century Houses 150 Of The World's Best	Robyn Beaver	Images Publ.
4	21st Century Sustainable Home	Cleary	Images Publ.
5	Abd Within The Range Of Architecture Vol.I	Gozak	Springer
6	Architects Data,4/E	Neufert	Wiley
7	Architect's Drawing A Selection Of Sketches-	Smith	Architectural Press
8	Architects Pocket Book,4/E	Ross	Architectural Press
9	Architectural Details 2003 (P65)	Architectural Press	Architectural Press
10	Architectural Drawings Construction & Design(E68)	Natascha Meuser	Dom Pub.
11	Architectural Finishes In The Built Environment	Jablonski	Archetype Pub.
12	Architectural Thought The Design Process	Brawne	Architectural Press
13	Architectural Annual 2008	Archiworld	Archiworld
14	Architecture Competition Annual	Archiworld	Archiworld

15	Architecture Competition Annual 2004 Vol.I	Archiworld	Archiworld
16	Architecture Competition Annual-8 2012	Archiworld	Archiworld
17	Architecture Competition Annual-Viii 2007	Archiworld	Archiworld
18	Architecture In India Since 1990	Mehrotra	Pictor
19	Architecture In Translation W/Cd 3 Vol.Set	Esra Akcan	Duke University Press
20	Architecture In Use	Vander	Architectural Press
21	Architecture Of The Home	Nylander	Wiley
22	Architecture Of Today	Papadakis	Terrail
23	Architecture Technology & Process (P29.99)	Abel	Architectural Press
24	At Home With The Makers Of Style (P24.95)	Scott	Thames & Hodson
25	Willats: Beyond Plan The Transformation of Persona	Willats	Wiley-Academic
26	Senosiain: Bio Architecture (P45.99)	Senosian	Architectural Press
27	Building Codes Illustrated	Ching	Wiley
28	Building Construction Hb (P24.99)	Chudley	Elsevier
29	Building Construction Hb,8/E	Chudley	Elsevier
30	Building Construction Illustrated,4/E	Ching	Wiley
31	Building Decorative Materials (P145)	Lee	Woodhead
32	Building Structures Illustrated Patterns	Ching	Wiley
33	Intro To Architecture	Ching	Wiley
34	Sustainable Homes 26 Designs That Respect the Earth	Trulove	Collins
35	Sustaining Architecture In The Anti Machine	Abley	Wiley
36	Timber Construction For Trade Industry	Wolfgang	Birkhauser
37	Time Saver Standards For Building Materials	Watson	BPB
38	Time Saver Standards For Housing & Resident	Panero	BPB
39	Time Saver Standards For Landscape Design	Dines	BPB
40	Urban Housing Forms	Zhou	Architectural Press
41	Window Systems For High Performance Buildings	Arasteh	Norton
42	Architecture Competition Annual 2008 Ix	Archiworld	Archiworld
43	Architecture With The People	Friedman	Musac
44	Archiworld:Archiworld Magazine Assorted	Archiworld	Archiworld
45	Archiworld:Archiworld Magazine,37 Books Set	Archiworld	Archiworld
46	Building Skins	Schittich	Birkhauser
47	Collective Housing A Manual	Lapuerta	Actar
48	Design Build Architecture In Practice	Thomas	Wiley
49	Freestanding Houses	Pfeifer	Birkhauser

50	Global Housing Projects Since 1980 Architect	Mateo	Actar
51	Guide To The Architecture Of The Indian Subcontinent	Kamiya	Atsushi Sato
52	Housing I	Archiworld	Archiworld
53	Sourcebook Of Contemporary Architecture	Vidiella	Collins
54	Top Houses -Ii	Tangart	Tangart
55	21st Century Architecture Apartment Living	Browne	Images Publ.
56	Architecture In A Climate Of Change	Smith	Architectural Press
57	Architecture Of The Visible Technology & U	Macphee	Continuum
58	Architecture - The Subject Is Matter	Hill	Routledge
59	Bamboo - A Material For Landscape & Design	Oprins	Birkhauser
60	Contemporary House Design	Daab	Daab
61	Courtyard Houses - A Housing Typology	Engelmann	Birkhauser
62	100 Landmarks	Beverley Jollands	Parragon
63	Time Saver Standards For Building	Watson	Mc Grawwhill
64	Time Saver Standards For Urban Design	Watson	Mc Grawwhill

B. List of Major Equipment/Instrument

- i. Measuring Tape
- ii. Digital Camera
- iii. Architectural Drafting Instruments
- iv. Computers
- v. CAD software

C. List of Software/Learning Websites

- i. www.archnet.org
- ii. www.greatbuildings.com
- iii. websites of architectural product manufacturers e.g. sanitary-ware manufacturers, door-window manufacturers, flooring material manufacturers and traders, etc.

10. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- **Prof. Bhaskar J. Iyer**, H.O.D Architecture, Govt. Polytechnic, Vadnagar
- **Prof. Poonam A. Trambadia**, Lecturer in Architecture, Govt. Polytechnic, Surat
- **Prof. Vishal K. Mashruwala**, Lecturer in Architecture, Govt. Polytechnic, Vadnagar
- **Prof. N.M. Chhatwani**, Lecturer in Architecture, Govt. Girls Polytechnic, Ahmedabad

Co-ordinator and Faculty Members from NITTTR Bhopal

- **Prof. Dr. J.P.Tegar**, Professor & Head, Department of Civil & Environment Engineering
- **Prof. M. C. Paliwal**, Associate Professor, Department of Civil & Environment Engineering