BIM SESSION WORK FLOW FOR OFFLINE & ONLINE STUDENTS

1st WEEK

AutoCAD & Vastu Session –

Topics to be covered in Vastu Session:

- What is Air and Light Ventilation?

- How is it related to Vastu?

- What is Vastu & how does Vastu technology works?

- What is the Significance of Vastu and its elements?

- How Vastu can be implemented in Building planning.

Topics to be covered in AutoCAD Session:

1.0 AUTOCAD: 2D INTERFACE

    1.1 INTRODUCTION TO AutoCAD:

    AutoCAD Screen Components, Invoking Commands in AutoCAD, AutoCAD Dialog Boxes, Starting a New Drawing, Saving Your Work, Setting of Drawing Units and Dimension style units.

    1.2 GETTING STARTED WITH AUTOCAD:

    Dynamic Input Mode, Drawing Lines in AutoCAD, Invoking tools Using Dynamic INPUT/Command, Prompt Coordinate Systems, Object Selection Methods, Setting Units Type and Precision, SETTING the Limits OF A DRAWING

    1.3 DRAWING COMMANDS:

    Drawing Lines, Drawing Circles; two points, three points and tangent-tangent-

Radius circle, Drawing Arcs and its types, Drawing Rectangles, Drawing Ellipses, Polygon Drawing, Polylines, Drawing Multilines, Placing Points, Drawing Infinite Lines, Writing a Single Line Text, Hatching

1.4 MODIFYING COMMANDS:

Copy command, Move command, Stretch command, Trim command, Extend command, Erase command, Rotate command, Fillet/Chamfer command, Array; Path, Polar & Rectangular command, Offset command, Mirror command, Block command, Scale command, Explode command

1.5 WORKING WITH DRAWING AIDS:

Understanding the Concept and use of LAYERS, Working with Layers, Object Properties

1.6 CREATING TEXT AND TABLES

Annotative Objects, Annotation Scale, Multiple Annotation Scales, Controlling the Display of Annotative objects, Creating Text, Entering Special Characters, Creating Multiline Text, Editing Text, Inserting Table in the Drawing, Creating a New Table Style.

1.7 Model Space Viewports, Paper Space Viewports & Layouts.

1.8 Plotting Drawings.

1.9 Hatching Drawings.

2.0 Working with Blocks.

2.0 AutoCAD 3D BASICS INTERFACE:

- ➢ 3D basic commands.
- ➢ Isometric concept and Drawings.
- ➢ Isometric commands.

Tasks to be done:

- Planning Assignment-1 (Residential Project)
- Planning Assignment -2 (Commercial + Residential Project)

Topics to be covered in REVIT ARCHITECTURE –

3.0 REVIT-ARCHITECTURE:

3.1 Modelling & Materials:

3.11 Create and modify architectural and site elements:

a. Work with walls and wall types

b. Create and modify floors, roofs & ceilings

c. Work with circulation elements: stairs, ramps and railings

d. Cut openings in building elements like walls, ceiling, roofs etc

e. Work with columns

f. Understand the functions and limitations of model and detail groups

g. Use massing elements

h. Work with Site and topography tools

3.12 Use and modify element materials:

a. Associate a material with an object or a style

b. Create and edit a basic material and its properties

c. Load a material library

3.13 Use Selection sets

3.14 Create and modify rooms and areas

a. Create, edit, and delete rooms

3.2 Families:

3.21 Manage family categories and types:

a. Configure family types

b. Understand concepts of family categories and types

c. Differentiate between types of families like system, component & In-place

d. Transfer system families between projects

3.22 Use family parameters:

a. Create or delete an instance or type parameter

b. Determine the appropriate parameter discipline, type & grouping

c. Modify a room calculation point

3.23 Create family content:

a. Select the appropriate family template

b. Add reference planes, lines and dimensions

c. Create geometry

d. Associate dimensional parameters

e. Work with hosted and non-hosted elements in a model

3.3 Documentation:

3.31 Annotate views:

a. Use Dimensions

b. Create and modify annotation families for documentation

c. Use a matchline

3.32 Create and use detail components

a. Load and create a detail component family

b. Add a detail component

c. Define a repeating detail

3.33 Demonstrate an understanding of phases and design options

a. Use phase filters

b. Assign, display, and accept primary design options

3.34 Use document revisions

a. Understand sheet issues/revisions

b. Create a revision cloud

3.35 Configure export and print settings

a. Configure export settings

b. Configure custom print setup

3.36 Work with colour schemes

a. Define and use area and room colour schemes

b. Create a colour scheme legend

3.4 Views:

3.41 Apply advanced view techniques:

a. Understand browser organization

b. Set view properties

c. Apply visibility/graphic overrides

d. Apply and edit view templates

e. Create and manage call-out views

f. Set up a view for rendering

g. Set up a sheet

h. Apply worksharing display modes to a view

i. Use duplicate views

3.42 Manage, create and modify schedules:

a. Develop and customize schedules

b. Manipulate schedule data

3.5 Revit Project Management:

3.51 Link or import files:

a. Understand the difference between imported and linked files

b. Manage linked files

c. Understand the concept of copy and monitor elements from a linked file

3.52 Define worksharing concepts:

a. Understand why worksharing features are used

3.53 Use levels and grids:

a. Modify level and grid types

b. Edit level and grid properties

3.54 Transfer project standards and establish shared coordinates:

a. Transfer and review project standards

b. Understand the concept of shared coordinates

3.55 Edit Object styles:

a. Control the appearance of elements at a project level

3.56 Conduct maintenance on a Revit project:

a. Understand and use purge

b. Understand and use the audit and compact tools

c. Assess review warnings in Revit

d. Check a model for interferences

3.57 Understand shared, project, and global parameters:

a. Understanding the use of shared, project and global parameters.

Tasks to be done:

- Assignment-1 - (Residential)
- Assignment-2 – (Commercial + Residential)

2nd WEEK & 3rd WEEK:

- DCS
- 3rd Week Final Presentation (AutoCAD & Revit Arch)

4th WEEK- REVIT STRUCTURE:

Topics to be covered in REVIT STRUCTURE –

4.0 REVIT-STRUCTURE:

4.1 Collaboration:

a. Create and modify levels

b. Create and modify Structural grids

c. Importing AutoCAD files into Revit

d. Link Revit models

e. Control the visibility for linked objects

4.2 Documentation:

a. Using temporary dimensions

b. Annotate beams

c. Add and modify text annotations

d. Add and use dimensions and dimension labels

e. Use detail components

f. Create and modify Column schedules, footing schedules, standard sheets

4.3 Modeling:

a. Place and modify structural columns, walls, custom wall types, place footings.

b. Create a concrete slabs and/or floors

c. Create and modify stepped walls in foundations

d. Place rebar

e. Add beams, beam systems, joists, cross bracing to joists

f. Create and use trusses

g. Create and modify floors, custom floors, sloped floors

h. Add floor openings for stairs

i. Create and modify stairs, ramps

j. Model and use roofs

4.4 Views:

a. Create section views

b. Create framing elevations

c. Use callout views

4th WEEK-SESSIONS:

- **Day-1** (Foundation Detailing)
- **Day-2** (Column & Beam Detailing)

- **Day-3** (Slab Detailing)
- **Day-4** (Staircase Detailing)
- **Day-5** (Shear wall & sump Tank Detailing)

5th WEEK & 6th WEEK

- DCS
- 6th Week Final Presentation (Revit Structure)

7th WEEK- REVIT MEP:

5.0 REVIT-MEP:

Topics to be covered in REVIT MEP –

5a.0 REVIT-MECHANICAL & PLUMBING:

5a.1 Collaboration:

a. Import AutoCAD files into Revit

b. Link Revit models

c. Copy levels and set up monitoring

d. Create floor plans

e. Use worksets

f. Resolve Coordination Review Errors

5a.2 Documentation:

a. Mechanical: Tag ducts & piping

b. Create sheets

c. Add and modify text & dimensions

d. Mechanical: Create duct/pipe legends

5a.3 Elements:

a. Differentiate system and component families

b. Edit family connectors

c. Create a new family type

5a.4 Modeling:

5a.41 Mechanical:

a. Add & use mechanical equipment

b. Add & modify air terminals, ducts, return ducts, duct accessories & fittings

c. Work with heating and cooling zones

d. Add & modify placeholder duct

e. Define a duct system

f. Work with spaces

g. Add & modify Size duct & check duct & disconnects

5a.42 Plumbing:

a. Add and modify fixtures, piping, pipe accessories & placeholder pipe

b. Add & use plumbing equipment

c. Create a plumbing system

d. Add and modify pipe systems perform interference check & pipe systems & disconnects

5a.5 Views:

a. View models

b. Apply view templates

c. Create detail views

d. Mechanical: Create and label HVAC plans

e. Plumbing: Create a plumbing view

f. Plumbing: Create and label plumbing plans

5b.0 REVIT-ELECTRICAL:

5b.1 Collaboration:

a. Import AutoCAD files into Revit

b. Link Revit models

c. Copy levels & set up monitoring

d. Create floor plans

e. Use worksets

f. Resolve coordination review errors

5b.2 Documentation:

a. Electrical: tag components

b. Create sheets

c. Create panel schedules

d. Add & modify text & dimensions

5b.3 Elements:

a. Differentiate system & component families

b. Edit family connectors

c. Create a new family type

5b.4 Modeling:

a. Add & modify receptacles, panels, lighting fixtures, switches, conduits, switch systems, security devices, wiring.

b. Create and modify circuits, lighting circuits, switching circuits

c. Use cable trays

d. Create Distribution system

e. Generate automatic wire layouts

f. Check circuits & disconnects

g. Perform interference check

h. Work with spaces, fire alarm devices & Site lighting

5b.5 Views:

a. View models

b. Apply view templates

c. Create detail views

d. Create and label wiring plans

7th WEEK- Sessions:

- **Day-1** (2D Electrical & 2D Plumbing) –

- **Day-2** (Mechanical) -

- **Day-3** (Electrical) -

- **Day-4** (Plumbing) –

- **Day-5** (Cross checking of documents) –

8th WEEK & 9th WEEK

- DCS

- 9th Week Final Presentation (Revit MEP)

10th WEEK- NAVISWORKS & MS PROJECT:

6.0 4D NAVISWORKS:

Topics to be covered in 4D & 5D Navisworks –

6.1 GETTING STARTED

a. Getting Started with Autodesk Navisworks.

b. Publishing, Merging/Append, Refreshing, and Emailing Files.

c. Selection Tree and Selecting Objects.

6.2 3D MODEL REVIEW:

a. Hiding Objects and Overriding Materials.

b. Object Properties.

c. Measuring and Moving Objects.

d. Selection and Search Sets.

e. Viewpoints.

f. Comments, Redlining, and Tabs.

g. Animations.

h. Sectioning.

i. Links.

j. Comparing Models.

k. Navisworks Real-Time Rendering.

l. Switchback.

6.3 CLASH DETECTIVE:

a. Clash Detective Overview.

b. Clash Results.

c. Clash Test Reporting.

d. Working with Clash Tests.

e. Audit Checks.

f. Exporting and Importing Clash Tests.

g. Method for Testing and Resolving Clashes.

6.4 TIMELINER:

a. Time Liner Overview.

b. Creating Tasks.

c. Gantt View.

d. Import Tasks from External Project File.

e. Configuring and Defining a Simulation.

f. Simulation Export.

7.0 5D NAVISWORKS:

7.1 5D QUANTIFICATION:

a. Quantification Overview.

b. Setting up a Quantification Project.

c. Item and Resource Management.

d. 3D Model and Virtual take-off.

e. Managing take-off Data.

f. 2D Take-offs.

g. Analysing Changes.

h. Exporting Take-off Data.

8.0 MS PROJECT:

Topics to be covered in MS Project:

    a. Work Breakdown Structure (WBS) and its rules.

    b. Scheduling a project plan.

    c. Configuring project management software.

    d. Managing project resources.

    e. Establishing project baselines for performance.

    f. Planning & controlling the project.

    g. Use of BIM & excel in estimation & costing.

    h. Rate analysis, DSR its application for tendering.

    i. Estimation thumb rules & through BBS.

    j. Estimated and projected costing.

    k. Investment vs. Rate of return Ratio (IRR).

    l. Profitability vs. Investment Charts.

    m. Critical Path Methods and Project Evaluation & Review Technique.

    n. Comparison between CPM and PERT.

10th WEEK-Sessions:

- **Day-1** (Navis works) –
- **Day-2** (Navis works) -
- **Day-3** (MS Project) -
- **Day-4** (MS Project) –
- **Day-5** (Cross checking of documents) –

11th WEEK & 12th WEEK

- DCS
- 12th Week Final Presentation (Navis works & MSP)

13th WEEK- 6D & 7D ANALYSIS:

9.0 6D & 7D Analysis in REVIT:

Topics to be covered in 6D & 7D Analysis –

9.1 6D Analysis –

9.1a 6D LIGHTING ANALYSIS MODEL:

a. Daylighting design challenges

b. Daylighting simulation results

c. Analysis Visualization Framework (AVF)

d. Revit Insight Integration.

9.1b 6D SOLAR ANALYSIS MODEL:

a. Select the surfaces to be analyzed.

b. **All Roof Exterior Surfaces** - Select all Roof elements for analysis

c. **All Mass Faces** - With conceptual masses, this option automatically selects all mass faces.

d. **User selection** - This option allows you to select your own mass and building element surfaces for analysis.

9.1c 6D ENERGY ANALYSIS MODEL:

a. Set the location of the model.

b. Set a weather station for the analysis.

c. Verify energy settings.

d. Create and analyze the energy model.

e. Review the analysis on the Insight dashboard.

9.2 7D: FACILITY MANAGAEMENT:

a. Create life-cycle BIM Strategies.

b. Documentation and manage the life-cycle.

c. BIM Embedded Q&M Manuals; CPIX Assessments.

d. BIM Maintenance Plans and Technical Support.

e. COBie_UK_2012 Compliances and Excel Sheet.

13th WEEK

a. **Day-1** (6D-Energy) –

b. **Day-2** (6D-Lighting) -

c. **Day-3** (6D-Solar) -

d. **Day-4** (7D-Cobie) –

e. **Day-5** (Cross checking of documents) –

14th WEEK & 15th WEEK

- DCS
- 15th Week Final Presentation (6D & 7D)

ADD-ON SOFTWARES & DOCUMENTS PREPARATION–

18th WEEK ONWARDS:

f. **PRIMAVERA**

g. **SYNCHRO PRO**

h. **INFRAWORKS**

i. **CIVIL 3D**

j. **TEKLA STRUCTURES**

BIM INTERNATIONAL CODES AND STANDARDS:

➤ BS1192:2007.

➤ PAS1192-2:2013.

➤ PAS1192-3:2014.

➤ BS1192-4:2015.

➤ BS-EN-ISO:19650 series.

➤ COBie Data Formulation.