Gyanmanjari Innovative University

Course Syllabus
Gyanmanjari Institute of Design
Semester-1 (B. Design)

Subject: CAD- Computer Aided Design-I - BDEIF11201
Type of Course: Skill based courses
Prerequisite: Basic knowledge of Computer

Rationale: Computer Aided Design is invariably used for Civil Engineering Drawing and visual representation before actual construction. With advancement in Building Technology, new features have been introduced in structures. Further structural design has also been modernized. This has further increased the importance of drawing and drafting software's which help in visualizing the structures thus increasing the understanding. Besides technological development in drafting software' have made them more user friendly thus making them virtually indispensable. Hence knowledge of Computer Aided Drafting has become even more important skill than before. Civil Engineering Drawing, the language of a Civil Engineer helps him in efficiently representing engineering details like plan, elevation, section, foundation, building elements, etc. for easy understanding of the clients, authorities, etc. Computer Aided Drafting (CA Drafting) helps in easily performing the above task and drastically reducing the time of preparation of the drawings.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
				Theory Marks		Practical Marks		CA	
CI	T	P	C	ESE	MSE	V	P	ALA	
0	0	4	2	00	00	10	40	50	100

Legends: CI-Classroom Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Course Content:

Sr. No	Course Content	% Weightage
1	**Introduction to CAD** Demonstrate the basics of CAD software and its important commands, prepare a simple building drawing file using basic draw and modify commands.	15
2	**Demonstration of 2D in Commands** Explain the applications of Edit commands, modify existing CAD Drawing, apply advance command for edit /modification of drawing, Prepare typical Drawings using Different Layer, develop final Drawings with using Dimension, Text and Hatching tools.	30
3	**Introduction to REVIT** Explain basics of Revit, demonstrate components of REVIT UI, prepare simple building drawing using REVIT, Demonstrate Rendering in REVIT and Calculate data from REVIT	10
4	**An Introduction to BIM** What is BIM?, Why BIM?, Benefits of BIM, Challenges of BIM, Information Management, Understanding RERA, Concepts of Smart homes & Smart Cities, Impact of BIM on the AEC Industry and Career Opportunities in BIM.	20
5	**Introduction to SketchUp 3D** Introduction of SketchUp, Use of SketchUp, Tool used in SketchUp and Advantage of sketch up over Auto Cad 3D	25

Continuous Assessment:

Sr. No.	Active Learning Activities	Marks
1	**Draw a 2D AutoCAD Rectangular room Plan:** Each individual student will draw a simple 2D AutoCAD plan of a rectangular room using the dimensions provided by the faculty. Create the AutoCAD file and upload it on the GMIU Web Portal.	10
2	**Draw a 2D AutoCAD 2BHK House Plan:** Each student will individually draw a 2D AutoCAD plan of a 2BHK house using their own dimensions. Create the AutoCAD file and upload it on the GMIU Web Portal.	10
3	**Poster on BIM Model Tools:** Students, in groups, will prepare a poster presentation chart on various BIM modeling tools. Upload the poster/chart file on the GMIU Web Portal.	10
4	**Report on REVIT Model Tools:** Each student will prepare a report on various Revit tools used in house modeling. Create a short note report explaining the tools and upload it on the GMIU Web Portal.	10

5	**Presentation on various Software using in civil engineering:** Students will prepare a group presentation on various software used in Furniture Design. Create a PowerPoint (PPT) file, present it in class, and upload the PPT on the GMIU Web Portal.	10
TOTAL		**50**

Suggested Specification table with Marks (Theory): NA

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage %	NA	NA	NA	NA	NA	NA

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course, the students should be able to:	
CO1	Demonstrate basic CAD software skills and create simple building drawings using essential draw and modify commands.
CO2	Apply 2D CAD editing, layering, dimensioning, and hatching tools to prepare and finalize technical drawings.
CO3	Understand Revit interface and tools to create, render, and extract data from simple building models.
CO4	Explain BIM concepts, benefits, challenges, and its impact on smart cities, RERA, and career opportunities in the AEC industry.
CO5	Understand the basics of SketchUp, explore its tools, and create simple 3D models for architectural visualization.

List of Practical

Sr. No.	Descriptions	Unit No.	Hrs.
1.	Understanding the interface and tools of AutoCAD, including how to navigate the various views and panels, create and modify objects, and work with layers and blocks.	1	04
2.	Understanding how to create a basic AutoCAD drawing, including creating lines, circles, arcs, rectangles, and other objects.	1	06
3.	Understanding how to use AutoCAD for collaboration and sharing, including how to import and export files, work with other team members, and use cloud collaboration tools like Autodesk Drive.	2	08
4.	Understanding the role of AutoCAD in various industries, including architecture, engineering, manufacturing, and construction.	2	08
5.	Understanding how to create and edit views in Revit, including 2D and 3D views, schedules, and sections.	3	06
6.	Understanding the role of Revit in various stages of a project,	3	08

	including design, construction, and operation.		
7.	Understanding how to create a BIM model and the various components that make up the model, including geometry, attributes, and relationships.	4	02
8.	Understanding how to manage and share BIM data, including file formats and data exchange standards.	4	02
9.	Understanding the role of BIM in various stages of a project, including design, construction, and operation	4	04
10.	Understanding the basic concepts and principles of SketchUp, such as the use of 3D modelling to create digital models of buildings, structures, and objects.	5	06
11.	Understanding the interface and tools of SketchUp, including how to navigate the various views and panels, create and modify objects, and work with layers and groups.	5	06
TOTAL			**60**

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory.

The internal evaluation will be done on the basis of Active Learning Assignment.

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in the laboratory.

Reference Books:

[1] "Architectural Design with SketchUp" by Alexander C. Schreyer
[2] "Mastering Autodesk Revit 2024" by Robert Yori et al.
[3] "AutoCAD 2024 for the Interior Designer" by Dean Muccio
[4] https://www.autodesk.com/education/edusoftware/overview?sorting=featured&filters=individual
[5] https://old.aicte-india.org/bfreedownloadsadesk.php
[6] www.Autodesk.com
[7] https://www.thesourcecad.com/autocad-tutorials/