

	Course Title: BASIC COMPUTER AIDED DRAFTING IN CIVIL ENGINEERING		
	Credits (L:T:P) : 0:2:4	Total Contact Hours: 78	Course Code: 15CE37P
	Type of Course: Practical, Drawing, Student Activity	Credit : 03	Core/ Elective: Core
CIE- 25 Marks		SEE- 50 Marks	

Pre-requisites: Basic computer Skills, Engineering Drawing.

Course Objective: To develop 2D civil engineering drawings of simple building elements and 3D drawings of simple objects.

Course Outcomes

At the end of the course, the students should be able to

Course Outcome		Experiments Linked	CL	Linked PO	Teaching Hrs
CO1	Interpret the basic concept and usage of CADD software. Compare the utilities of alternate drafting software from open source.	<i>1</i>	<i>R,U</i>	1,2,3,4,5,7,8,9	06
CO2	Setup CADD workstation and demonstrate basic commands of Computer Aided Design and Drafting Software.	<i>2</i>	<i>R,U,Ap</i>	1,2,3,4,5,7,8,10	09
CO3	Prepare and plot 2D drawings of Building Components.	<i>3,4,5,6,7,8</i>	<i>U,Ap</i>	1,2,3,4,5,7,8,9,10	18
CO4	Create and plot 2D objects.	<i>9,10</i>	<i>U,Ap</i>	1,2,3,4,5,7,8,10	33
CO5	Create and plot 3D objects.	<i>11,12</i>	<i>U,Ap</i>	1,2,3,4,5,7,8,10	12
CO6	Perform in teams and explore new ideas to interpret the existing models	<i>Suggested activity</i>	<i>U,A,C</i>	1,2,3,4,5,7,8,10	*
Total sessions					78

Legend- R; Remember U: Understand Ap: Application Ay: Analysis C:Creation E: Evaluation

* Related to Student activity beyond classroom hours.



Programme outcome Attainment Matrix

Course	Programme Outcome									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
	Basic knowledge	Discipline knowledge	Experiments and practice	Engineering Tools	Engineer and society	Environment & Sustainability	Ethics	Individual and Team work	Communication	Life long learning
Basic computer aided drafting in civil engineering	3	3	3	3	3	-	1	3	3	3

Level 3- Highly Addressed, Level 2-Moderately Addressed, Level 1-Low Addressed.

Method is to relate the level of PO with the number of hours devoted to the COs which address the given PO.

If $\geq 40\%$ of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 3

If 25 to 40% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 2

If 5 to 25% of classroom sessions addressing a particular PO, it is considered that PO is addressed at Level 1

If $< 5\%$ of classroom sessions addressing a particular PO, it is considered that PO is considered not-addressed.

DETAILED COURSE CONTENT

UNIT	MAJOR TOPICS	MARKS ALLOTTED
1. Introduction to CADD		
Experiment 1	General features of CADD, CADD work station, Hardware and Software requirements, Advantages of using CADD, Starting CADD, Understanding CADD Editor Screen- title bar, menu bar, dashboard, standard tool bar, drawing area, UCS, command prompt area, status bar.	06
2. Demonstration of commands in CADD		
Experiment 2	Commands- Command Entry Options using -Command Line, Menus (File, Edit, View, Insert, Format, Tools, Draw, Dimension, Modify, Window, Help) and Dialog Boxes. Understanding the use of CADD Menus and Tool Bars, CADD Basic Entities- Drawing Line, Arc, Circle, Rectangle and polygons using different coordinate Systems such as Absolute Cartesian Coordinates, Relative Cartesian Coordinates, Absolute Polar coordinates, Relative Polar Coordinates, Direct distance entry and line command, Picking coordinates on the screen and line command.	09



UNIT	MAJOR TOPICS	MARKS ALLOTTED
3. Creating a new drawing		
	Using a wizard, using a template, starting from scratch. Selection of units, Selection of paper space, Setting up of limits Draw 2D drawings of simple building components and Print/ Plot the following drawings using Plot Settings.	
Experiment 3	Draw the Elevation and cross section of fully panelled Door	3
Experiment 4	Draw the Elevation and cross section of fully panelled Window and glazed Window	3
Experiment 5	Draw the Cross Section through Wall	3
Experiment 6	Draw the sectional Elevation of Spread footing	3
Experiment 7	Draw the sectional Elevation and Plan showing Reinforcement details of Column footing.	3
Experiment 8	Draw the plan and sectional Elevation of Dog-Legged Staircase.	3
4. Developing 2D drawings of Buildings		
Experiment 9	Draw Plan, Elevation and Sectional View of Single Room Building. Print/ Plot the above drawings using Plot Settings.	33
Experiment 10	Drawing Plan, Elevation and Sectional View of Two Room Residential Building. Print/ Plot the above drawings using Plot Settings.	
5. Developing Isometric and 3D drawings		
Experiment 11	Develop isometric drawings of Simple Objects such as Steps, Footings etc. Print/ Plot the above drawings using Plot Settings.	12
Experiment 12	Develop a 3D Model for a Single Room Building.	
Total		78



SUGGESTED STUDENT ACTIVITIES

The topic should be related to the course in order to enhance his knowledge, practical skill & and lifelong learning, communication, modern tool usage.

1. Plot the different line styles used in Civil Engineering drawing.
2. Collect and measure the dimensions of different paper sizes available in market.
3. Prepare a plan, elevation and sectional view of a single room building and plot on different paper sizes.

4. Develop a 3D model of simple objects like cube, prism, cylinder and cone.
5. Measure the dimensions of a beam and column develop 3D model.
6. Measure the dimensions of your classroom/any other room and create a 3D model.
7. Prepare a plan showing arrangements of steps spiral stairs.
8. Develop a conic section
9. Object of drawing models non-dissected and dissected
 Rectangular prism, Rectangular pyramid,
 Triangular prism and pyramid, Square prism and pyramid,
 Pentagonal prism and pyramid, Hexagonal prism and pyramid,
 Octagonal prism and pyramid, Decagonal prism and pyramid,
 Cube, cone sphere, cylinder, half cylinder, quarter cylinder,
 Semi, cylinder, tetrahedron, octahedron

NOTE

1. Students should select any one of the above or other topics relevant to the subject approved by the concerned faculty, individually or in a group of 3 to 5. Students should mandatorily submit a written report and make a presentation on the topic. The task should not be repeated among students. Report will be evaluated by the faculty as per rubrics. Weightage for 5 marks Internal Assessment shall be as follows:

Unsatisfactory 1, Developing 2, Satisfactory 3, Good 4, and Exemplary 5.

2. Reports should be made available along with bluebooks to IA verification officer.

Example of model of rubrics / criteria for assessing student activity

Dimension	Students score				
	(Group of five students)				
	STUDENT 1	STUDENT 2	STUDENT 3	STUDENT 4	STUDENT 5
Rubric Scale	Unsatisfactory 1 , Developing 2 , Satisfactory 3 , Good 4 , Exemplary 5				
1.Organisation	4				
2.Fulfill team's roles & duties	3				
3.Conclusion	2				
4.Conversions	5				
Total	14				
Average=(Total /4)	14/4=3.5=4				
Note: Concerned faculty (Course coordinator) must devise appropriate rubrics/criteria for assessing Student activity for 5 marks One activity on any one CO (course outcome) may be given to a group of FIVE students					

Note: Dimension should be chosen related to activity and evaluated by the course faculty.

Course Delivery: The course will be delivered through lectures and Demonstration and CAD practices.



Course Assessment and Evaluation Scheme:

	What		To whom	When/Where (Frequency in the course)		Max Marks	Evidence collected	Course outcomes
Direct Assessment method	CIE	IA	Students	Twice test (average of two tests)	Test 1	10	Blue books	1,2,3
					Test 2			3,4,5
				Record	10	CAD exercises	1,2,3,4,5	
	Student activity	05		Reports/Presentations	1,2,3,4,5,6			
	SEE	End Exam		End of the course	50	Answer scripts at BTE	1,2,3,4,5,6	
Indirect Assessment	Student Feedback on course		Students	Middle of the course		---	Feedback forms	1,2,3,4,5,6 Delivery of course
	End of Course Survey			End of the course		---	Questionnaires	1,2,3,4,5,6 Effectiveness of Delivery of instructions & Assessment Methods

*CIE – Continuous Internal Evaluation

*SEE – Semester End Examination

Note:

- I.A. test shall be conducted as per SEE scheme of valuation. However obtained marks shall be reduced to 10 marks. Average marks of two tests shall be rounded off to the next higher digit.
- Rubrics to be devised appropriately by the concerned faculty to assess Student activities.

Questions for CIE and SEE will be designed to evaluate the various educational components such as:

Sl. No	Bloom's taxonomy	% in Weightage
1	Remembering and Understanding	30
2	Applying the knowledge acquired from the course	40
3	Analysis	10
4	Synthesis (Creating new knowledge)	10
5	Evaluation	10



TEXT BOOKS

- CAD in Civil Engineering a Laboratory Referrel- Dr M.A.Jayaram, D.S.Rajendra Prasad, Sapna Book House
- Sham Tickoo-CADD: A Problem-Solving Approach Thomson LearningEMEA, Limited
- George Omura- Mastering Auto CAD BPB Publication



- Arshad N Siddique, Zahid Khab, Mukhtar Ahmed- Engineering Drawing with CADD

E-Learning:

<http://www.sketchup.com>
<http://www.autodesk.in/products/3ds-max/overview>
<http://www.we-r-here.com/cad/tutorials/index.htm>
<http://www.cadtutor.net/tutorials/CADD/>
http://www.caddprimer.com/CADD_training_tutorial/CADD_training_lessons.html
<http://www.CADDmark.com/>
<http://www.CADDtutorials.net/>

SCHEME OF END EXAMINATION

1	Record + viva on Suggested activity Report	05 +05 marks
2	Concept of CADD work station and Demo of commands	10 marks
3	Drawing and taking print out of given 2D problem	15 marks
4	Isometric drawing/3D drawings	15 marks
Total		50 marks

Equipment List

- Computers with Latest Configuration (One Computer per student in practical session).
- Latest licensed Computer Aided Drafting Software.
- Plotter of size A0
- LCD Projector
- UPS 5KVA

