A) COURSE

Course Id:	Course
5676	**Computer aided design**

Class Hours per Week	Lab hours per week	Complementary practices	Credits	Total hour course
0	3	0	3	48

A) BASIC COURSE FACTS

	EE (IEA)	ME (IM)	MME (IMA)	EME (IME)	MTE (IMT)
Level:	I				
Course Type (Required/Elective)	Required				
Prerequisite Course:	NO ONE				
CACEI Classification:	IA				

C) General Course Information

At the end of the course, the student will be capable of:
Develop basic concepts of engineering technical drawing and use that to computer-aided design.

D) TOPICS (CONTENTS AND METHODOLOGY)

1.- Generalities in technical drawing	10 hours
Specific goal: Apply basic concepts of engineering technical drawing.	

1.1 Introduction to engineering technical drawing.
1.2 Stage directions
1.3 Scales
1.4 Views
1.5 sketching

Readings and other resources	
Teaching methods	Presentation
Learning activities	

2.- Environment of computer drawing	2 hours
Specific goal: Identify the workspace of computer-aided drawing.	

2.1 Introduction to computer drawing	
2.2 Environment of the computer drawing program.	
2.3 Button bars, menu and help	
2.4 Use of basic commands for creating and managing files.	
2.5 Drawing editor	
2.6 Procedure to invoke commands.	
2.7 Procedure to enter data.	
Readings and other resources	Internet, references according needs of the unit, consulting and research.
Teaching methods	Learning oriented to projects
Learning activities	Analysis of requirements, research, ideas organization, development of creativity to formulate possible solutions. Feasibility analysis, creativity and logic to develop selection criteria for solutions, preliminary elaboration of parts lists, critical components identification, quote and estimating costs and delivery times, organization and proposal preparation.

3.- Project		**2 hours**
Specific goal:	Identify handling of screens and workspaces in computer aided drawing	
3.1 Handling of screens		
3.2 Handling of views		
3.3 Axes system		
3.4 Measurement units		
3.5 Format work units		
3.6 Layers		
3.7 Dialog boxes and Tool Palettes		
3.8 Begin a new draw		
3.9 Open an existent draw		
3.10 Properties of a draw		
Readings and other resources	Internet, references according needs of the unit, consulting and research.	
Teaching methods	Learning oriented to projects	
Learning activities	Analysis and research information, application of knowledge acquired in the course application of knowledge acquired during the investigation, tests elaboration and information analysis, Elaboration of an individual electronic portfolio and report of weekly advance.	

4.- Validación		**3 hours**
Specific goal:	Dominate handling of auxiliary and characteristic points tools	
4.1 Grating and limits definition		
4.2 Orthogonal mode.		
4.3 Function keys and mouse		
4.4 Change of properties of an object and parameters.		
4.5 Reference modes to an object: extremes, medium, central, intersection, tangent, perpendicular, closer, base.		
4.6 Absolut, relative and polar coordinates		
4.7 Designation modes		
4.8 Handling of commands at the keyboard		
Readings and other resources	Internet, references according needs of the unit, consulting and research.	
Teaching methods	Learning oriented to projects	
Learning activities	Elaboration of the instructions manual and the written final report.	

5.- Basic commands of the draw menu.	**7 hours**

Specific goal:	Use basic commands of computer aided drawing of the draw menu.

5.1 Lineation
5.2 Object erasing
5.3 Poli line
5.4 Regular polygon
5.5 Plotting arcs
5.6 Plotting circles
5.7 Plotting ellipses
5.8 Generation of tables
5.9 Generation and editing texts
5.10 Generation and editing shading
5.11 Visualization processes.

Readings and other resources	Internet, references according needs of the unit, consulting and research.
Teaching methods	Learning oriented to projects
Learning activities	Elaboration of the instructions manual and the written final report.

6.- Basic commands of modify menu.	**3 hours**

Specific goal:	Use basic commands of computer aided drawing of modify menu.

6.1 Symmetry
6.2 Gap
6.3 Copy
6.4 Decompose
6.5 Move
6.6 Scale
6.7 Turning
6.8 Divide
6.9 Polar and Rectangular matrix
6.10 Stretch
6.11 Cut
6.12 Extrude
6.13 Chamfer
6.14 Splice

Readings and other resources	Internet, references according needs of the unit, consulting and research.
Teaching methods	Learning oriented to projects
Learning activities	Elaboration of the instructions manual and the written final report.

7.- Control and Properties of layers in objects.	**2 hours**

Specific goal:	Master and manage layers

7.1.- Layers generating
7.2.- Properties of layers.
7.3.- Layers administration
7.4.- Color administration by layer.
7.5.- Administration of kind of line by layer.

Readings and other resources	Internet, references according needs of the unit, consulting and research.
Teaching methods	Learning oriented to projects
Learning activities	Elaboration of the instructions manual and the written final report.

8.- Blocks and attributes		**3 hours**
Specific goal:	Master and manage attributes in Blocks.	
8.1.- Blocks generating 8.2.- Insert Blocks 8.3.- Data attributes in objects		
Readings and other resources	Internet, references according needs of the unit, consulting and research.	
Teaching methods	Learning oriented to projects	
Learning activities	Elaboration of the instructions manual and the written final report.	

9.- Dimensioning parts		**3 hours**
Specific goal:	Use the dimensioning of parts	
9.1.- Kinds of dimensions and parameters 9.2.- Text in dimensions. 9.3.- Generating Kinds of dimensions. 9.4.- Administration of dimension style and aspect control.		
Readings and other resources	Internet, references according needs of the unit, consulting and research.	
Teaching methods	Learning oriented to projects	
Learning activities	Elaboration of the instructions manual and the written final report.	

10.- Printing		**1 hour**
Specific goal:	Identify handling of printing functions.	
10.1.- .Printing preview 10.2.- .Creation of "layouts"		
Readings and other resources	Internet, references according needs of the unit, consulting and research.	
Teaching methods	Learning oriented to projects	
Learning activities	Elaboration of the instructions manual and the written final report.	

11.- Three dimension drawings		**8 hours**
Specific goal:	Manage objects in three dimensions	
11.1. - Three dimension coordinates. 11.2. - UCS with orthogonal views. 11.3. - Definition of 3D viewpoint. 11.4.- Generating regions 11.5.- Operating and editing in 3D 11.6.- Realistic visualizations in 3D 11.7.- Generating 3D views 11.8. - Surfaces generating. 11.9.- Assemble of solids		
Readings and other resources	Internet, references according needs of the unit, consulting and research.	
Teaching methods	Learning oriented to projects	
Learning activities	Elaboration of the instructions manual and the written final report.	

E) TEACHING AND LEARNING METHODOLOGIES

Exhibition of topics of the course. Use of autocad, elaboration of projects that stimulate the teamwork between students, test application and develop of laboratory practices.

F) EVALUATION CRITERIA:

The grade of the subject is the average of 2 partial exams and a final ordinary exam. Each evaluation is weighed with the requisites of the teacher. To approve is needed to pass the correspondent laboratory.

Evaluation:	Schedule	Suggested Form of Evaluation and weighing	Topics
First Partial exam			
Second Partial exam			
Third Partial exam			
Total			100%
Ordinary Exam			
Lab			
Extraordinary exam			
Title exam			
Regularization exam			

G) BIBLIOGRAPHY AND ELECTRONIC RESOURCES

Main Books

- AUTOCAD 2000, Bill Burchard y David Pitzer
- Chevalier A. Dibujo Industrial. Montaner y Simon.
- Calderón B. F. Dibujo Técnico Industrial. Porrúa.