COMPUTER AIDED AIRCRAFT ENGINEERING DRAWING

V Semester: AE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
AAE106	Core	-	-	3	2	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36				Total Classes: 36		

COURSE OBJECTIVES:

The course should enable the students to:

I. Understand the concepts and various tools used in design module.
II. Understand the design of typical structural components.
III. Understand the design of typical aircraft components.
IV. Understand the design of three view diagram of a typical aircraft

COURSE LEARNING OUTCOMES (CLOs):

1. Undestand the interface of three dimensional computer aided drawing softwares.
2. Gain knowledge about different workbenches in computer aided three dimensional interactive application (CATIA)
3. Ability to model different components in CATIA.
4. Understand difference between surface, sheet, plate and component.
5. Remember different tools in different workbenches and to be able to use them efficiently.
6. Ability to use tools in each workbench to design desired component in CATIA.
7. Understand what are boolean operations and where they are used.
8. Gain knowledge about different sheet metal operations and hoe to execute them in sheet metal design workbench.
9. Understand different terminologies used in sheet metal operations.
10. Gain knowledge about different operations used in surface design workbench.
11. Understand how to make complex shapes using different tools in surface design workbench.
12. Gain knowledge about top down and bottom up assembly methods and where to use which method.
13. Understand how different components are assembled based on sub assembly and main assembly types.
14. Understand about different tolerances and how tolerances are given to components.
15. Ability to read and understand different kinds of symbols used in manufacturing industry and how they are achieved.
16. Ability to design different aircraft components using different tools in three dimensional CAD software's.

LIST OF EXPERIMENTS

Week-1	**SKETCHER**

Interface, Sketch Tools, View Tool bar, Profile Tool bar, Operation Tool bar, Tools , Constrain tool bar, Transformation Tool bar, User Selection Filter, Standards, Visualizations.

Week-2	**PART DESIGN**

Sketch Based Features, Dress up Features, Transformation Features, Reference Elements, Measure, Thickness, Boolean Operations.

Week-3	**SHEET METAL DESIGN**
Walls, Cutting and Stamping, Bending, Rolled Walls,	
Week-4	**SURFACE DESIGN**
Surface Operations, Wireframe, Replication.	
Week-5	**ASSEMBLY**
Product Structure Tools, Constrains.	
Week-6	**GD&T**
Introduction to Geometric Dimensioning and Tolerance, Weld Symbols, GD&T Symbols, Types of Tolerances, Types of views, Roughness Symbols	
Week-7	**DRAFTING**
Views, Annotations, Sheet Background.	
Week-8	**DESIGN OF AIRCRAFT WING**
Design of any two types of Aircraft structures	
Week-9	**DESIGN OF FUSELAGE**
Design of fuselage with internal components	
Week-10	**DESIGN OF NOSE CONE**
Design of Nose cone structures	
Week-11	**DESIGN OF LANDING GEAR**
Design of Main landing gear and nose landing gear	
Week-12	**REVISION**
Revision	
Reference Books:	
1. http://www.ehu.eus/asignaturasKO/DibujoInd/Manuales/R12_manual_catia_v5.pdf 2. http://www.engr.psu.edu/xinli/edsgn497k/TeaPotAssignment.pdf 3. http://file1.engineering.com/pdf/PartDesign.pdf 4. https://www.3ds.com/fileadmin/general/Terms/Licensed-Program Specifications /CATIA /CATIA_ V5R18.pdf	