STUDY & EVALUATION SCHEME FOR CERTIFICATE PROGRAMME IN CATIA

Code	Units	Study Scheme Total Hrs.		Credits	Marks Evaluation Scheme								Total Marks
					Internal Assessment			External Assessment					
		Th	Pr		Th	Pr	Total	Th	Hrs	Pr	Hrs	Total	
CMEE5-101	Communication Skills	8	-	1	25	-	25	25	1	-	-	25	50
CMEE5-101P	Communication Skills Lab.	-	24	1	-	25	25	-	-	50	3	50	75
CCATS1-101	Introduction to Design	52	-	2	25	-	25	50	2	-	-	50	75
CCATS1-102	Introduction to Design Lab.	-	150	4	-	50	50	-	-	100	4	100	150
CCATS1-103	Engineering components and design	16	-	1	25	-	25	50	2	-	-	50	75
CCATS1-104	Engineering components and design lab	-	160	4	-	75	75	-	-	100	4	100	175
CCATS1-105	Assembly and Design	22	80	6	50	50	100	-	2	100	4	100	200
CMEE5-106P	#Student Center Activity	-	48	2	-	25	25	-	-	-	-	-	25
CMEE5-107P	+4–Week Industrial Training at the end of Semester	-	-	4	-	-	-	-	-	100	3	100	100
	TOTAL	**98**	**462**	**25**	**125**	**225**	**350**	**125**	**-**	**450**	**-**	**575**	**925**

SCA will consist of co-curricular activities like extension lectures on entrepreneurship, Industrial tour, environment, sports, hobby club, such as photography. seminars, declamation contests, educational field visits, NCC, NSS, cultural activities.

+**Industrial Training**

Before completion of the semester, the students will go for training in a relevant industry/field organization for a minimum period of 4 weeks and prepare a diary. The student will prepare a report at the end of training. This report will be evaluated by the concerned instructor in the presence of one industry representative from the relevant trade/field.

Total weeks per semester: 16, Total working days per week: 5, Total hours per day: 7, Total hours in a semester: 16x5x7 = 560

One credit is defined as one hour of lecture per week or two hours of practical per week in the programme.

GUIDELINES FOR ASSESSMENT OF STUDENT-CENTERED ACTIVITIES (SCA)

The maximum marks for SCA should be25. The marks may be distributed as follows:

i) 5 marks for general behavior and discipline
(By Principal or HOD in consultation with the instructor(s)/trainers)

ii) 5 marks for attendance as per following
(By the instructors/ trainers of the department)
a) Up to75% Nil
b) 75%to80% 02marks
c) 80%to85% 03 marks
d) Above85% 05 marks

iii) 15 marks maximum for sports/NCC/NSS/Cultural/Co-curricular activities as per following:

(By In-charge of Sports/ Cultural/NCC/NSS/Co-curricular activities) 15marks - for National level participation or inter-university competition 10 marks - participation any two of the activities
05 marks – participation at the internal sports of the institute/college/university Note: There should be no marks for attendance in the internal session of different subjects.

UNIT – I SUBJECT CODE: CMEE5-101 COMMUNICATION SKILLS	
Learning Outcomes: After undergoing this unit, the students will be able to: 1. Speak Confidently. 2. Overcome communication barriers. 3. Write legibly and effectively. 4. Listen in proper perspective. 5. Read various genres adopting different reading techniques. 6. Respond to telephone calls and E-mails effectively.	
Practical (24Hours)	**Theory (08 Hours)**
	Basics of Communication ● Process of communication ● Types of communication-formal and informal, oral and written, verbal and non-verbal ● Objectives of communication. ● Essentials of communication. ● Barriers to communication. (1hour)
● Looking up words in a dictionary (meaning and pronunciation) (2hours)	Functional Grammar and Vocabulary ● Parts of speech ● Tenses ● Correction of incorrect sentences (2hours)
● Self and peer introduction ● Greetings for different occasions (1 hour)	Listening ● Meaning and process of listening ● Importance of listening ● Methods to improve listening skills Speaking ● Importance ● Methods to improve speaking ● Manners and etiquettes (2hours)
● Newspaper reading (1 hour)	Reading ● Meaning ● Techniques Of Reading: skimming, scanning, intensive and extensive reading (1hour)

• Vocabulary enrichment and grammar exercises • Exercises on sentence framing accurately (6hours)	Functional Vocabulary • One-word substitution • Commonly used words which are often misspelled • Punctuation • Idioms and phrases (2hours)
• Reading a loud articles and essays on current and social issues • Comprehension of short paragraph (5hours)	
• Write a short technical report • Letter writing (3hours)	
• Participate in oral discussion • Respond to telephonic calls and E-mails effectively. • Mock Interview (6hours)	

Means of Assessment

1. Assignments and quiz/class tests
2. Mid-term and end-term written tests
3. Laboratory and practical work
4. Viva-voce

UNIT-II

SUBJECT CODE: CCATS1-101

INTRODUCTION TO DESIGN

Learning Outcomes:

After undergoing study of this unit, the students will be able to

1. Design and Modeling techniques used in Engineering.
2. 2D Modeling and sketching.
3. Engineering drawing techniques.
4. CATIA 2D designing and sketching

Practical **150hrs.**	**Theory** **52hrs.**
● Introduction to CATIA software ● Features of CATIA: Various products available in CATIA for Product Design, Simulation, Communication CATIA Graphical User Interface - Feature manager design tree, Handles, Confirmation corner, mouse buttons, Command Manager ● Introduction to 2D drawing or sketching ● Sketch Entities – Centerline line, Line, Circle, Arc, Ellipse, Rectangle, Slots, Polygon, Parabola, Ellipse, Partial Ellipse, Spline, Spline tools, Points, Text, Construction geometry. ● Sketch Tools - Fillet, Chamfer, Offset, convert entities, Trim, Extend, Mirror, Move, Copy, Rotate, Scale, Stretch, Sketch pattern, Sketch picture ● Blocks – Make block, edit block, insert block, Add/Remove Entities, Rebuild, Save ● Explode Relations-Adding Sketch Relation, Automatic relations. ● Adding relations and Advanced dimensioning techniques and base feature options	● **Introduction to design and modeling:** Introduction to drawing equipment and use of instruments. Symbols and conventions in drawing Practice. Different types of Modeling Techniques/tools ● **Introduction to Dimensioning:** Concepts of scale in drawing, Types of scales. ● **Lettering and Numbering:** Single Stroke, Double Stroke, inclined, Uppercase and Lowercase. ● **Types of lines:** Definition, types and applications in Drawing Classification of lines (Hidden, Center, construction, Extension, Dimension, Section) - Drawing lines of given length (Straight, curved)- Drawing of parallel lines, perpendicular line – Methods of Division of line segment ● **Basic Definition of geometrical objects:** Points, lines and planes. Nomenclature and practice of - Angle: Measurement and its types, method of bisecting. - Triangle - different types - Rectangle, Square, Rhombus, Parallelogram. ● - Circle and its elements

Means of Assessment

1. Assignment and quiz/class tests.
2. Mid-term and end-term written tests.
3. Viva–voce.
4. Practical Work.

UNIT-III
SUBJECT CODE:CCATS1-103
ENGINEERING COMPONENTS AND DESIGN

Learning Outcomes:

After undergoing study of this unit, the students will be able to learn

- 3D Designing and Modeling in CATIA.
- Projection of parts
- Method of Presentation of Engineering Drawing

Practical **160hrs**	**Theory** **16hrs**
• **Introduction to part design:** Part modeling tool classification. • Sketch based features, Dress up features, Surface based features, Transformation features. • **Part design workbench document**: part design menu bar, specification tree, work area, compass, toolbar, prompt area, power input area. • **Sketch based features**: pad, drafted fileted pad, multi-pad, pocket, drafted fileted pocket, multi-pocket, shaft, groove, hole, rib, slot, solid combine, stiffener, multi - sections solid, removed multi-sections solid • **Dress-up Features**: edge filet, variable radius filet, face-face filet, tri- tangent filet, chamfer, draft angle, draft reflect line, variable angle draft, shell, thickness, thread/tap, remove face, replace face. • **Transformation features:** Translation, rotation, symmetry, mirror, rectangular pattern, circular pattern, user pattern, scaling • **Conditions of part design workbench:** Do's and Don'ts of shaft, rib, stiffener, solid combine, multi section solid, thread/tip. • **PROCEDURE:** Invoke pad command, Invoke pocket command, • Invoke hole command, invoke slot command, Invoke filet command. • **PART DESIGN EXERCISE**: Machine vise, die casting, screw jack and parts, landing gear and its components, piston, bulkhead, ribs and spars. • **Mathematical modeling of part**	• **Dimensioning:** Definition, types and methods of dimensioning (functional, nonfunctional and auxiliary) – Types Of arrowheads -Leader Line with text • **Projection of PARTS-**Definition of solids, types of solids, and elements of solids. Projection of solids in the first or third quadrant. • **Section of Solids:** Sectioning and its purpose. Procedure of Sectioning, Types of sectional planes. • **Method of Presentation of Engineering Drawing:** Pictorial View-Orthogonal View - Isometric view • **Isometric Projection:** Classification of pictorial views, Basic Principle of Isometric projection, Difference between isometric projection and isometric drawing. Isometric projection of solids such as cube, prism, pyramid and cylinder, and assignments on isometric projection of simple machine parts. • **Orthographic Projection:** Review of principle of Orthographic Projection,

design: Machine vise, die casting, screw jack and their parts, landing gear and its components, piston, bulkhead, ribs and spars. ● **Motion Study of part design:** Machine vise, die casting, screw jack and their parts, landing gear and its components, piston, bulkhead, ribs and spars.	Sketch/drawing of blocks, and of simple machine parts.
● **Animation of part design:** Machine vise, die casting, screw jack and their parts, landing gear and its components, piston, bulkhead, ribs and spars. ● **Analysis of Structures and Design:** Machine vise, die casting, screw jack and their parts, landing gear and its components, piston, bulkhead, ribs and spars. ● **Case Studies:** Machine vise, die casting, screw jack and their parts, landing gear and its components, piston, bulkhead, ribs and spars. ● **Design optimization:** Machine vise, die casting, screw jack and their parts, landing gear and its components, piston, bulkhead, ribs and spars. ● **Practical based on Industry**: Nut and bolt, engine and its components, Parts used in Automobile industry, fuselage, bulkheads and landing gear. ● **"Minor in House Projects":** Component and design.	

UNIT-IV
SUBJECT CODE: CCATS1-105
ASSEMBLY & DESIGN

Learning Outcomes:

After undergoing study of this unit, the students will be able to:

- Assembly Modeling
- Understand about Assembly Approaches.
- Understand about tool parts and its uses.

Practical **80hrs**	**Theory** **22hrs**
● **Introduction to Assembly Modeling Approaches** ● **Types of assembly design approach –** Top down and Bottom-up Approach . ● **Toolbars:** product structure tools, constraints, move, ● **Condition of assembly workbench:** Do's and Don'ts. ● **Products structure toolbar:** Import files, multi-instances ● **Constraints Toolbar:** contact constraint, fix, re-use pattern. ● **Manipulating Components -** Replacing Components, Rotating Components, Move Components, Collision Detection, Detecting Interference ● **Creating Pattern**-Assembly Pattern, Mirror Creating Exploded Views Top-Down Assembly ● Smart Fasteners.	● **Importance of Machine Drawing –** Brief revision of 1st and 3rd angle projections - Understand the concepts of Orthographic projections and Sectional views.

• Creating Extrude, Revolve, Swept, loft, Boundary surface. Inserting Planar Surface, Offset Surface, Free form Extending a surface, Surface fill, Ruled Surface, Trim Surface, Replace Face, delete face, Untrim surface, knit surface, Thickening a Surface • Generating Drawing Views • Introduction to Angle of Projection • **Generating Views -** Generating Model View, Projected Views, Inserting Standard 3 View, Auxiliary Views, and Detailed views. • **Crop view, broken –**Out Section, Section View, Alternate Position View, working assembly specific view, drawing properties, Manipulating views	

Means of Assessment

1. Assignment and quiz/class tests
2. Mid-term and end-term written tests
3. Minor project at the end of the semester.
4. Viva–voce
5. Practical Work

INDUSTRIAL TRAINING– I (4 Weeks)

The purpose of industrial training is to:

1. Develop understanding regarding the size and scale of operations and nature of industrial/field work in which students are going to play their role after completing the courses of study.
2. Develop Confidence Amongst the Students Through First-hand experience to enable them to use and apply institute-based knowledge and skills to perform field activities.
3. Develop special skills and abilities like interpersonal skills, communication skills, attitudes and values.

It is needless to emphasize further the importance of Industrial Training of students during their certificate programme. It is industrial training, which provides an opportunity to students to experience the environment and culture of the world of work. It prepares students for their future role as a skilled person in the world of work and enables them to integrate theory with practice.
An external assessment of 100 marks have been provided in the study and evaluation scheme of 1st Semester. Evaluation of professional industrial training report through viva-voce/presentation aims at assessing students understanding of materials, industrial process, practices in industry/field organization and their ability to engage in activities related to problem solving in industrial setup as well as understanding of application of knowledge and skills learnt in real life situation.
The instructor along with one industrial representative from the concerned trade will conduct a performance assessment of students. The components of evaluation will include the following:

a) Punctuality and regularity 20%
b) Industrial training report 50%
c) Presentation and viva-voce 30%