



CVM
UNIVERSITY

Aegis: Charutar Vidya Mandal (Estd.1945)

FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2022-23

Programme: Bachelor of Technology (Mechanical Engineering)

Semester: III

Course Code: 202090304

Course Title: Computer Aided Drafting and Computing

Course Group: Engineering Science Course

Course Objectives: To provide background and fundamentals of advanced CAD and computing tools like AUTOCAD, SCILAB, MATLAB and OCTAVE for enhancing design, analysis and mathematical computing skills

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
Lecture	Tutorial	Practical		Theory		J/V/P*		Total
				Internal	External	Internal	External	
0	0	4	2	--	--	50 / 18	50 / 17	100/35

* J: Jury; V: Viva; P: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	Introduction to CAD tools Introduction of different CAD tools, Commands, Interactive Techniques, Toggle Drawing Modes, Units and Limit Command, Coordinate System Geometry & Selection Commands: Lines, Circles, Rectangles, Polylines, Arcs, Polygons, Ellipses, Construction Line, Move, Copy, Rotate, Mirror, Scale, Lengthen, Stretch, Zoom, Ortho and Polar Tracking, Object Snaps and Tracking, Layer States, Properties by Layer, Layer Tools Advanced Commands: Trim, Extend, Fillet, Chamfer, Polyline Edit, Spline, Offset, Explode, Join, Align, Break, Divide, Array, Helix, Donut, Wipeout, blocks, Text Adding in Drawing, Multiline Text, Hatch, Dimension Style, Geometric Dimensioning & Tolerancing, Multileader, System Variables, The Properties Palette, Quick Select, Geometry Measurement Tools, Layout and Printing: Using Layouts and Viewports, Scaling Viewports, DWF Printing and Publishing	30



2	<p>Introduction to computational tool for engineers:</p> <p>Basics: Working in command window, Arithmetic operations with scalars; Display formats, elementary math built-in functions, Defining scalar variables: the assignment operator, rules about variable names, predefined variables and keywords, Commands for managing variables</p> <p>Creating arrays:</p> <p>Creating 1-Dimensional array (vector), 2-Dimensional array (Matrix); The zeros, ones and, eye Commands, The transpose operator, Addressing array :Using colon : in addressing arrays, Adding elements to existing variables, Deleting elements from existing variables, Built-in functions for handling arrays, Strings and Strings as variables</p> <p>Mathematical Operations with Arrays:</p> <p>Addition and subtraction, multiplication and division of arrays, Element-by-element operations</p> <p>Using Script Files and Managing Data:</p> <p>The workspace and workspace window, Input to script file, Output commands: the disp command, the fprintf command, the save and load commands, commands for Importing and exporting data</p> <p>2-D and 3-D Plots:</p> <p>The plot command: Plot of Given Data, Plot of a Function, The fplot command, Plotting multiple graphs in the same plot: Using the hold on and hold off Commands, Using the line Command, Formatting a plot: Formatting a Plot Using Commands, Formatting a Plot Using the Plot Editor, Plots with logarithmic axes, Histograms, Polar plots, Putting multiple plots on the same page, Multiple figure windows, mesh and surface plots</p> <p>Programming using computational tools:</p> <p>Relational and logical operators, Conditional statements: The if-end Structure, The if-else-end Structure, The if-elseif-else-end Structure, The switch-case statement, Loops: for-end Loops, while-end Loops, nested loops and nested conditional statements, The break and continue commands</p> <p>User-Defined Functions and Function Files:</p> <p>Creating a function file, Structure of a function file: function definition line, input and output arguments, the help text lines, function body, Local and global variable, saving a function file, Using a user-defined function, comparison between script and function files</p>	30
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List of Practicals / Tutorials:

1	Introduction to AutoCAD/Creo/Solidwork
2	To learn Drafting Skills: Drawing with AutoCAD
3	To learn Editing Techniques though Advanced Commands
4	To learn Detailing of drawing using Annotating commands
5	To Prepare orthographic drawings of any mechanical component
6	To study the fundamentals of SCILAB
7	To learn the different functions including looping, branching and plotting using SCILAB.
8	To study the basics and Language fundamentals of MATLAB



9	To learn the Elementary and higher order Mathematical operations using MATLAB
10	To learn 2D-3D plotting and basic programming using MATLAB.

Reference Books:

1	AutoCAD 2019: A Problem - Solving Approach, Basic and Intermediate by Sham Tickoo, Purdue University Northwest
2	Beginning AutoCAD 2019 by Cheryl R Shrock & Steve Heather, Industrial Press, Inc.
3	Up and Running with AutoCAD 2020 2D Drafting and Design by Elliot J. Gindis, Robert C. Kaebisch
4	Machine Drawing by K L Narayana, P Kannaiah, k.Venkata Reddy, New Age International Publication
5	Scientific Computing with MATLAB and Octave-by Alfio Quarteroni, Fausto Saleri, Paola Gervasio, Springer
6	MATLAB for Beginners: A Gentle Approach – MathWorks
7	MATLAB for Beginners: A Gentle Approach by Peter Issa Kattan
8	SCILAB REFERENCE MANUAL, Scilab Group INRIA Meta 2 Project/ENPC Cergrene
9	Scilab for very beginners, Scilab Enterprises
10	Programming for Computations–MATLAB/Octave by Svein Linge, Hans Petter Langtangen, springer open
11	Parametric Modeling with Creo Parametric by Randy H. Shih
12	Learn SOLIDWORKS 2020- Tayseer Almatarr

Supplementary learning Material:

1	NPTEL
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Pedagogy:

- Audio Visual presentations/demonstrations
- Assignments/Quiz
- Continuous assessment
- Interactive methods
- Course Projects

Internal Evaluation:

The internal evaluation comprised of combination of various components such as Certification courses, Assignments, Mini Project, Simulation, Model making, Case study, Group activity, Seminar, Poster Presentation, Unit test, Quiz, Class Participation, Attendance, Achievements etc.

Suggested Specification table with Marks (Theory) (Revised Bloom’s Taxonomy):

Distribution of Theory Marks in %						R: Remembering; U: Understanding; A: Applying; N: Analyzing; E: Evaluating; C: Creating
R	U	A	N	E	C	
20%	15%	10%	30%	15%	10%	

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.



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Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Apply 2D-3D drafting and modeling knowledge for Computer aided designing.	50%
CO-2	Apply computational tools like SCILAB/MATLAB/OCTAVE for advanced analysis and mathematical computation.	50%

Curriculum Revision:

Version:	2
Drafted on (Month-Year):	June-2022
Last Reviewed on (Month-Year):	--
Next Review on (Month-Year):	June-2025