



**MASTER CERTIFICATE COURSE
IN COMPUTER AIDED TOOL
ENGINEERING**



curriculum

**Ministry of Micro, Small and Medium
Enterprises, New Delhi
(MSME-Technology Centre)**

COURSE NAME: Computer Aided Design (CAD-Auto CAD and Solid Works)

COURSE CODE:

COURSE OUTCOMES: The aim of this course student should be able to:

- Understand types of different CAD/CAM/CAE software.
- Create 2D geometric sketches by using Auto CAD/Collab CAD and Solid works a software.
- Develop 3D modeling by using advanced command.
- Clarify of Knowledge to the assembly constraint & develop different types of assembly design by using Collab CAD & Solid Work.
- Understand design generative & interactive drafting.

THEORY HOURS: PRACTICAL HOURS: 120

THEORY MARKS:

PRACTICAL MARKS: 60

Unit No.	Unit Name	Unit level outcomes	Contents (chapters/topics)	PR hours	Marks
UNIT-I		At the end of this Unit the student should be able to: <ul style="list-style-type: none"> • Understand CAD/CAM/CAE software. • Understand various feature in CAD software. • Understand various types of CAD software. • Understand Uses and Importance of CAD software in Industries. • Understand selection criteria of CAD software. 	Capability of CAD Software and Introduction to AutoCAD, Collab CAD, Solid Work. Description of the feature that have been added or changed since new Release CAD. Criteria for selection of CAD workstations, Shingle Design Process, Design criteria, Geometric modeling, entities, 2D & 3D Primitives. Different Types of cad software. Also comparison of various CAD Software. CAD software features. Concept of hardware & software.	20	8
UNIT-II		At the end of this Unit the student should be able to: <ul style="list-style-type: none"> • Understand drawing curve object. • Create various types of sketch geometry. • Understand editing property tools. • Understand controlling drawing display. • Understand geometric dimension & tolerance method 	Drawing curve objects (Circle, Arc, Ellipse, elliptical arcs). Creating solid filled areas- Regions, Hatch, Dot-nut, DD type. Drawing line object like line, polyline, multiline etc. Drawing curve objects like Circle, Arc, Ellipse, elliptical arcs etc. Editing objects using the object property tool bar and various method & Controlling Drawing Display. (Carry, Lengthen, Stretching, Offset, Align, Trim, Extend, Array etc. Detailed discussion on Dimensions, Geometrical Dimension, Tolerance method in AUTOCAD.	25	12

UNIT-III		<p>At the end of this Unit the student should be able to:</p> <ul style="list-style-type: none"> • Working with block & defining block attributes. • Understand Concept of Isometric Drawing, Layout & Plotting. • Execute of solid modeling / 3d modelling. • Create surface modeling. 	<p>Working with block & defining block attributes. Concept of Isometric Drawing, Layout & Plotting. Creating of solid modeling / 3d modelling. Like creating, Editing, and modification technique. Creating of surface modeling like creating, Editing, and modification technique.</p>	25	14	
UNIT-IV		<p>At the end of this Unit the student should be able to:</p> <ul style="list-style-type: none"> • Understand Capability of Solid work Software. • Understand Basic Part Modeling, Basic Modeling, Terminology, Choosing the Best Profile, Choosing the Sketch Plane, Details of the Part feature. • Understand concept of assembly constraint. • Clarify Different type of assembly. 	<p>Introduction & Capabilities of Solid Work. SolidWorks Basics and the User Interface What is the SolidWorks Software Design Intent File References Opening Files The SolidWorks User Interface. Basic Part Modeling, Basic Modeling, Terminology, Choosing the Best Profile, Choosing the Sketch Plane, Details of the Part Boss Feature, Patterning, revolving, shelling, ribs & editing features. Assembly- Bottom-Up Assembly, Creating a New Assembly.</p>	25	12	
UNIT-V		<p>At the end of this Unit the student should be able to:</p> <ul style="list-style-type: none"> • Understand Bill of Materials. • Create Assembly Drawings. • Create & draw various drafting views. • Understand dimensions, annotations & various Engineering symbols. 	<p>Bill of Materials, Assembly Drawings, Drafting generate standard three views, model view, and predefined view, standard section views, crafting drawings, creating dimensions, annotations, notes and surface finish symbols, add geometric tolerance to the drawing views, add center marks and center lines to the drawing views, add center marks and center lines to the drawing views</p>	25	14	

COURSE NAME: CAD/CAM (UNIGRAPHICS CAD & UNIGRAPHICS CAM)

COURSE CODE:

COURSE OUTCOMES: The aim of this course student should be able to:

- Understand advance Computer aided design software (UNIGRAPHICS CAD & UNIGRAPHICS CAM) as compare to other CAD software.
- Create 2D geometric sketches by using UNIGRAPHICS CAD & UNIGRAPHICS CAM software.
- Develop 3D solid & surface modeling by using advanced command.
- Understand assembly constraint & develop different types of assembly design.
- Understand design generative & interactive drafting.
- Apply knowledge in create complicated modeling & creative/innovative solution.
- Understand Post processing.
- Execute & generate various Milling, Lathe, EDM operations.

THEORY HOURS:

PRACTICAL HOURS: 120

THEORY MARKS:

PRACTICAL MARKS: 60

Unit No.	Unit Name	Unit level outcomes	Contents (chapters/topics)	PR hours	Marks
UNIT-I		<p>At the end of this Unit the student should be able to:</p> <ul style="list-style-type: none"> • Understand advance computer aided design. • Understand Different types CAD software. • Understand advanced features added & changed since new release software. • Analyze difference between various software as compare to UNIGRAPHICS CAD & UNIGRAPHICS CAM. • Execute the concept of hardware & software. 	<p>Capability of CAD Software and Introduction to UNIGRAPHICS CAD & UNIGRAPHICS CAM. Description of the feature that have been added or changed since new Release software. Criteria for selection of CAD workstations, Shingle Design Process, Design criteria, Geometric modeling, entities, 2D & 3D Primitives. Different Types of cad software. Also comparison of various CAD Software. CAD software features. Concept of hardware & software.</p>	02	02

UNIT-II		<p>At the end of this Unit the student should be able to:</p> <ul style="list-style-type: none"> • Have fundamental knowledge of UG-CAD software. • Create complicated geometry sketch • Understand Adding Geometric & Dimensional Constraint to sketches. • Perform Drawing sketches for solid models. • Understand various sketching tools. • Understand & Create sketches in the Sketch task environment & Modeling Environment. 	<p>Introduction of Unigraphics-CAD. History of cad & UG. Technical terms related to UG-CAD. Drawing sketches for solid models. Creating sketches in the Sketch task environment & Modeling Environment. Understand Various Sketching Tool. Editing, Extruding, Revolving sketches. Adding Geometric & Dimensional Constraint to sketches.</p>	18	08	
UNIT-III		<p>At the end of this Unit the student should be able to:</p> <ul style="list-style-type: none"> • Understand Working with Datum plane, Coordinate System, and datum axes. • Understand Advance Modelling Tool. • Apply advance editing, modifying, creating feature. • To execute Boolean, extrusion termination operations. • Create 3D model design. 	<p>Working with Datum plane, Coordinate System, and datum axes. Specifying Boolean operation, Specification other Extrusion Termination option. Advance Modelling Tool like creating various types of Hole, Grooves, Slots, Dove-Tail Slots, Chamfer, and Edge Blend. Pattern Feature Tool, Mirror Feature Tool, and Sweeping Sketches along guide curve. Creating swept, Tubes or cables, Threads, Shell Features.</p>	20	10	
UNIT-IV		<p>At the end of this Unit the student should be able to:</p> <ul style="list-style-type: none"> • Understand surface modeling concept. • Create surface model. • Understand concept of assembly 	<p>Various Assembly constraints. Working with bottom up and top down assembly. Design in context. Generating bill of material. Tool Develop & design in UG-CAD. Surface Modelling Feature, surface analysis, curve analysis, Family table. Generating,</p>	20	10	

		<p>constraint.</p> <ul style="list-style-type: none"> • Understand concept of Drafting. • Understand different types of view. • Use different engineering symbols 	<p>Editing, and Dimensioning the Drawing views. Types of Drawing View, Modifying the properties of Generated drawing view, printing tools, print, plot.</p>			
UNIT-V		<p>At the end of this Unit the student should be able to:</p> <ul style="list-style-type: none"> • Understand capabilities of UG CAM. • Understand CAM concept, Master Model concept. • Understand Manufacturing application. 	<p>Introduction to Unigraphics CAM environment. Review of Modelling. Introduction to CAM concept, Master model concept. Machining environment, Operation Navigator. Re-entering into the Manufacturing application. Manufacturing Tools, Creating new operation. Manufacturing applications, Saving part file, closing part file.</p>	30	15	
UNIT-VI		<p>At the end of this Unit the student should be able to:</p> <ul style="list-style-type: none"> • Understand Various Milling and Lathe operations by using Unigraphics CAM. • Execute various drilling, reaming operation & hole making etc. • Understand various boundary setting. • Execute all milling & lathe operation by using UG CAM. • Understand Wire EDM, EDM operation. • Understand generate Wire EDM Operation. 	<p>Various Milling and Lathe operations by using Unigraphics CAM. Point to point machining. Creating drilling & reaming operation and hole making. Planner mill overview Profiling, Single level, Multi-level. Multi region, Creation of Boundaries. Setting Custom Boundary Member Data Setting Drive Cutting Method, Ramping method. Cut types, Trim boundary, and Uncut Region boundary. Creating Cavity Milling operation. Blank Geometry and offset, Uses of cutting option. Creating fixed contour operation. Lathe cross section, common turning parameters. Rough & Finish turning, What is wire EDM, EDM dialog overview? Wire EDM operation, creating Wire EDM Operation. Internal & External Trim operation</p>	30	15	

COURSE NAME: COMPUTER AIDED ENGINEERING (ANSYS & HYPERMESH)

COURSE CODE: ANSYS WORKBENCH MECHANICAL

COURSE OUTCOMES:

After completion of course Student should be able to

- Able to Analyze and understand customers need
- Able to Discuss and finalize product needs
- Prepare Conceptual design and finalize
- Test against standards and parameters
- Analyze using CAE software
- interpret of output
- apply CAE in Tool Design

THEORY HOURS:

PRACTICAL HOURS: 120

THEORY MARKS:

PRACTICAL MARKS: 60

Unit No.	Unit Name	Unit level outcomes	Contents (chapters/topics)	PR Hrs.	Marks	
UNIT-I		At the end of this unit student should be able to <ul style="list-style-type: none">• Understand Finite element method.• Work with ANSYS Graphical user interface• Describe stress strain relationship• solve static Analysis	Introduction to Finite Element Method of solving field problems using ANSYS workbench. User Interface of ANSYS Workbench Mechanical, Boundary conditions. Strain-Displacement relations. Stress-strain relations. One Dimensional Problem: Finite element modeling. Local, natural and global coordinates and shape functions. Quadratic shape functions, application of static Analysis with ANSYS	2	4	

			Workbench Mechanical.			
UNIT-II		<p>At the end of this unit student should be able to</p> <ul style="list-style-type: none"> • Understand the axial stress on trusses and frame • To apply proper remote boundary conditions • Knowledge of post processing • Evaluate the results of solution 	<p>Analysis of trusses and frames: Analysis of plane truss with number of unknowns not exceeding two at each node. Analysis of frames with two translations and a rotational degree of freedom at each node. Analysis of Beams: Element stiffness matrix for two noded, two degrees of freedom per node for beam element. Solving the using ANSYS Workbench Mechanical & details of result reading IN POST PROCESING.</p>	8	06	
UNIT-III		<p>At the end of this unit student should be able to</p> <ul style="list-style-type: none"> • To use of finite element modeling with ANSYS Workbench Mechanical • Apply boundary conditions in ANSYS Workbench Mechanical • Results reading • Optimization of analysis 	<p>Finite element modeling of two dimensional stress analysis problems with constant strain triangles and treatment of boundary conditions. Finite element modeling of Axisymmetric solids subjected of axisymmetric loading with triangular elements. Convergence requirements and geometric isotropy To Subjected To Design Optimization And Parametric Of Post processing Result Of ANSYS Workbench Mechanical</p>	10	05	
UNIT-IV		<p>At the end of this unit student should be able to</p> <ul style="list-style-type: none"> • To have Fundamental knowledge of NON-LINER • To understand thermal behavior • To describe conduction, convection & radiation. • To use 1D & 2D element of thermal 	<p>Steady state heat transfer analysis: One dimensional analysis of a fin and two dimensional conduction analysis of thin plate. Using the NON-LINER solver to solve the Complex problem in ANSYS Workbench Mechanical Dynamic analysis: Formulation of finite element modeling of Eigen value problem for a stepped bar and beam. Evaluation of Eigen values and Eigen vectors.</p>	16	06	
UNIT-V		<p>At the end of this unit student should be able to</p> <ul style="list-style-type: none"> • To knowledge basic of 3D element • To understand the factor of safety concept • To predict the behavior of analysis • To use ANSYS Workbench Mechanical 	<p>Finite element formulation of three dimensional problems in stress analysis. And design Optimization over the safety factor to predict the failure of design and stress value in ANSYS Workbench Mechanical</p>	12	05	

		simulation tools			
UNIT-VI		<p>At the end of this unit student should be able to</p> <ul style="list-style-type: none"> • Understand the dynamics of Analysis • Describe the steady state conditions over the analysis • To have validation of analysis • To execute the knowledge in tooling. 	Finite Element formulation of Dynamic transient analysis result validation and supporting data file to simulate the real world problems into ANSYS Workbench Mechanical & Application of computer aided engineering in tool and die engineering.	12	4
UNIT-VII		<p>At the end of this unit student should be able to</p> <ul style="list-style-type: none"> • Understand the Geometry creation • Understand the editing of geometry. • Understand the Manual Auto Meshing. 	Node, Line, Surface, Primitives, Solid, Point edit, Node edit, Lines edit, Surface edit, Edge edit, De feature, Mid surface, Different manual meshing options, Auto meshing, 3-D meshing	30	15
UNIT-VII		<p>At the end of this unit student should be able to</p> <ul style="list-style-type: none"> • Understand the Quality Criteria • Describe the Optribstruct & Hyper view. • Understand the Capabilities of hyper form. • Understand the one step analysis. 	Check elements, Quality criteria, Save and rectify elements, Knowledge of different quality parameters, Different collectors, Defining load and constraints, Running analysis, Viewing results in Hyper view, Updating collectors, Capabilities of hyper form, Introduction to One Step and Incremental Analysis, Performing One Step Analysis	30	15

COURSE NAME: Advanced-CAD (CREO PARAMETRIC)

COURSE CODE:

COURSE OUTCOMES: The aim of this course student should be able to:

- Understand advance Computer aided design software (CREO PARAMETRIC) as compare to other CAD software.
- Create 2D geometric sketches by using CREO PARAMETRIC software.
- Develop 3D solid & surface modeling by using advanced command.
- Understand assembly constraint & develop different types of assembly design.
- Understand design generative & interactive drafting.
- Apply knowledge in create complicated modeling & creative/innovative solution.

THEORY HOURS: PRACTICAL HOURS: 80

THEORY MARKS:

PRACTICAL MARKS: 60

Unit No.	Unit Name	Unit level outcomes	Contents (chapters/topics)	PR hours	Marks	
UNIT-I		<p>At the end of this Unit the student should be able to:</p> <ul style="list-style-type: none"> • Understand advance computer aided design. • Understand Different types CAD software. • Understand advanced features added & changed since new release software. • Understand difference between various software as compare to CREO PARAMETRIC & CATIA. • Execute the concept of hardware & software. 	<p>Capability of CAD Software and Introduction to CREO PARAMETRIC & CATIA. Description of the feature that have been added or changed since new Release software. Criteria for selection of CAD workstations, Shingle Design Process, Design criteria, Geometric modeling, entities, 2D & 3D Primitives. Different Types of cad software. Also comparison of various CAD Software. CAD software features. Concept of hardware & software.</p>	2	4	
UNIT-II		<p>At the end of this Unit the student should be able to:</p> <ul style="list-style-type: none"> • Have knowledge in sketching interface. • Understand various sketch profile 	<p>Sketching in CREO PARAMETRIC, Creating and constraining various sketch profile, Operations on sketch Geometry viz. corner, quick trim, break, chamfer. Project 3D Elements, Intersect 3D Elements, Isolate sketch profile. Various</p>	24	16	

		<p>tool.</p> <ul style="list-style-type: none"> • Have Knowledge various modification tools. • Create complicated geometry sketch • Understand & Use Project 3D Elements, Intersect 3D Elements, Isolate sketch profile 	<p>sketch based projects.</p>			
UNIT-III		<p>At the end of this Unit the student should be able to:</p> <ul style="list-style-type: none"> • Understand 3D Modeling concept. • Use various workbench based feature. • Illustrate advanced Transformation features. • Use and create Surface Based Features. • Execute various surface creation methods. • Perform advanced solid & surface modeling 	<p>Various workbench based features viz. pad, pocket, shaft, Groove, Hole etc. Transformation Features Translate, Rotate, Mirror, R/C pattern, Scale etc. Surface Based Features split, close surface, sew surface. Various advance tasks power copy, catalogs, design table etc. Tweak features. Various surface creation methods method extrude, revolve, offset, swept, loft. Operation on shape geometry join, healing, trim, extract geometry projects. Advanced commands e.g. bend solid, toroid bend etc.</p>	30	24	
UNIT-IV		<p>At the end of this Unit the student should be able to:</p> <ul style="list-style-type: none"> • Understand concept of assembly constraint. • Understand difference between bottom up and Top down assembly. • To develop Assembly model. • Understand concept of Drafting. • Understand different types of view. • Use different engineering symbols • Create Bill of material. 	<p>Various Assembly constraints. Working with bottom up and top down assembly. Design in context. Generating bill of material. Tool Develop & design in CREO PARAMETRIC. Creating various views through wizard. Creating various section views. Add a B.O.M. Adding text and labels. Dimensioning, Various engineering symbols, Translators. Tool Develop & design in CREO PARAMETRIC.</p>	24	16	

COURSE NAME: DESIGN OF PRESS TOOLS

COURSE CODE: DPT

COURSE OUTCOMES:

After completion of course Student should be able to

- Understand clearly the tool design parameters of Press Tools
- Design against standard and parameters
- Apply design principles to specific problem
- Interpret of output and confirming to specifications
- Collecting data related to design and manufacturing
- Communicate with manufacturing line

THEORY HOURS: 20

PRACTICAL HOURS: 80

THEORY MARKS: 60

PRACTICAL MARKS: 60

Unit No.	Unit Name	Unit level outcomes	Contents (chapters/topics)	TH Hrs.	Marks	
UNIT-I		At the end of this unit student should be able to: <ul style="list-style-type: none">• Understand and classify Press machines• Describe the characteristics of press machines• Explain the principle of stretch forming machine• Understand feeding and unloading equipment• Have fundamental knowledge of Design principles of presses	Classification of Mechanical, Hydraulic, and pneumatic presses, Press Characteristics, safety devices in presses. Principles of stretch forming machines, principles of feeding and unloading equipment	2	04	

UNIT-II		<p>At the end of this unit student should be able to:</p> <ul style="list-style-type: none"> • Explain shearing theory • Explain tooling • List different type of tools • Perform mathematical calculations for designing • Will be able to calculate best economy for production. 	<p>Design of Dies: Introduction terminology shearing dies- types of dies – analysis process shearing clearance – size and tolerances of die opening and punch – force, power, energy in shearing – loading center, shearing with inclined edges – strip layouts, economical stock – Utilization.</p>	6	18	
UNIT-III		<p>At the end of this unit student should be able to</p> <ul style="list-style-type: none"> • Describe and select elements of press tool • Perform Design calculation for elements • Apply alignment system design for press tool 	<p>Elements of shearing dies – die plates – split dies, rules of development for split dies, inserts, types of punches, punch holders, punches – strippers – calculation of springs and rubber ejector, shedders, stops – pilots – stock guides – alignment system design for press tools.</p>	6	18	
UNIT-IV		<p>At the end of this unit student should be able to</p> <ul style="list-style-type: none"> • Explain compound and progressive dies • Design Compound and progressive tool 	<p>Simple Piercing tool, Blanking Tool, Compound dies, progressive dies.</p>	6	18	

COURSE NAME: DESIGN OF MOULDS

COURSE CODE:

COURSE OUTCOMES:

After completion of course Student should be able to

- Understand clearly the tool design parameters of Moulds
- Design against standard and parameters
- Apply design principles to specific problem
- Interpret of output and confirming to specifications
- Collecting data related to design and manufacturing
- Communicate with manufacturing line

THEORY HOURS: 20

PRACTICAL HOURS: 80

THEORY MARKS: 60

PRACTICAL MARKS: 60

Unit No.	Unit Name	Unit level outcomes	Contents (chapters/topics)	TH Hrs.	Marks	
UNIT-I		At the end of this unit student should be able to: <ul style="list-style-type: none">• Describe terminology in moulds• Understand different types moulds• List elements of moulds• Describe the functions of element / component of tools	Basic terminology in moulds, Mould cavities and cores, Bolters, Ancillary items, Attachment of mould to platen, Basic Terminology injection, ejector plate assembly, ejection techniques, ejection from fixed half, sprue pullers, feed system – runner, gates	2	06	
UNIT-II		At the end of this unit student should be able to: <ul style="list-style-type: none">• To select standard moulds system	Parting surface –general, flat parting surface, non-flat parting surface, venting. Mould cooling – general, cooling insert-type mould plates, Standard mold system – general considerations, standard two-parts mould systems,	6	18	

		<ul style="list-style-type: none"> • To Clarify select best option among various option available • To explain significance of parting surface • Study/Analyses problem faced in designing & manufacturing tool 	deviations from the standard mould.			
UNIT-III		<p>At the end of this unit student should be able to:</p> <ul style="list-style-type: none"> • To select split moulds • To use standard parts for split moulds • Understand side cores and cavities • Design moulding with undercuts • To identify and apply various design features 	Splits – general, sliding splits, angled-lift splits, standard parts for the splits type mould. Side cores and cavities – general design features, types of side core and side cavity, standard mould parts. Moulding internal undercuts – general, from pin, split cores, side cores.	6	18	
UNIT-IV		<ul style="list-style-type: none"> • Understand customer requirement and component specification • To draw the conceptual drawing for appropriate mould • Perform design calculation for tooling • To select different standard element. • To draw final tool design. • Evaluate design against standard • Prepare bill of material 	Procedure for designing an injection mould – general, primary positioning of inserts, ejector system, complete the top half the drawing, complete the plan view, complete the cross-section, complete drawing and checking mould drawings	6	18	

COURSE NAME: ENTREPRENEURSHIP

COURSE CODE:

COURSE OUTCOMES:

After completion of course Student should be able to

- Understand Enterprise Registration.
- Understand Business Skills - Motivation and Leadership
- Apply Managerial Accounting.
- Apply Financial Analysis and Planning.
- Effective Communicate.

THEORY HOURS:

PRACTICAL HOURS:

20

THEORY MARKS:

PRACTICAL MARKS:

Unit No.	Unit Name	Unit level outcomes	Contents (chapters/topics)	PR Hrs.	Marks	
UNIT-I	Introduction to Entrepreneurship & Enterprise Registration.	At the end of this unit student should be able to: <ul style="list-style-type: none">• Define entrepreneurship• Demonstrate the qualities of successful entrepreneur• List the benefits of being an entrepreneur• Identify challenges faced by entrepreneurs• List the various types of enterprises• Identify the best model for registration for the particular enterprise• Execute registration of an enterprise under various legislations including PAN, VAT, and service tax.	Entrepreneurship, Qualities of a successful entrepreneur, steps to being your business. Process of setting up a business enterprises, Choosing the type of organization, Registering a business, Pan registration, Vat registration, Service tax registration, Companies act registration, Factories Act registration, Check your understanding, References for further reading	03		

UNIT-II	Business Skills - Motivation and Leadership & Book keeping Inventory and Working Capital Management	<p>At the end of this unit student should be able to:</p> <ul style="list-style-type: none"> • Explain what is motivation • Explain Maslow's hierarchy of needs • Discuss the factors that motivate MSME entrepreneurs; • Plan SMART goals • Demonstrate effective leadership's skills. • Explain Book keeping. • Explain Inventory Management • Working Capital Management. 	<p>Motivation and need fulfilment, Factors that motivate MSME, Entrepreneurs, Leadership-meaning and styles.</p> <p>Types of vouchers, Payment method receipt vouchers, Invoice or bill, Journal voucher, Supporting documents, Separate book for self. Objective, Meaning of inventory, Inventory levels, Costs of inventory, Managing inventory, Reorder level.</p> <p>Working capital, Working capital management, Sales on cash and credit, Cash and purchases, Managing creditors, Working capital management, Funding of working capital, Product pricing Types of pricing, Check your understanding</p>	04		
UNIT-III	Effective Communication & Managerial Accounting.	<p>At the end of this unit student should be able to:</p> <ul style="list-style-type: none"> • Define communication • List the various ways to communicate • Explain the communication process • Identify various barriers to communication • Demonstrate the effective communication. • Explain the basic principles of accounting • List the various books of account • Explain the meaning of final account • Compare the profit and loss account • Analyses the balance sheet • Examine the cash flow statements. 	<p>What is communication, Forms of communication, Class. On the basis of number of senders and receivers, Activity, Class. On the basis of number of modes of communication, Barriers to communication, Overcoming barriers and, communicating effectively, Check your understanding, References for further reading.</p> <p>What is accounting, Why accounting basic principles of accounting ,Debit and credit, Basic principles, Accounting head , Income, Expenses, Assets, Liabilities, Books of account, Final account, Profit and loss statement, Balance sheet, Cash flow statement, Check your understanding, References for further reading.</p>	04		
UNIT-IV	Financial Analysis and Planning & Introduction to Developing a Business Plan.	<p>At the end of this unit student should be able to:</p> <ul style="list-style-type: none"> • Understand the Financial Statements and Analysis • Understand Ratio Analysis • Understand Budget Planning and Analysis • Explain the meaning of the term "business plan" • List the features of a business plan • Develop and write a business plan 	<p>Primary financial statements, Financial statement analysis, techniques of analysis, Ratio analysis – classification of ratios, liquidity ratios, current ratio, acid test ratio, profitable ratios, gross profit margin ratio, net profit margin ratio, leverage ratios, debt equity ratio. Leverage ratio, Efficiency Ratio.</p>	04		

			Budgeting and its benefits, annual planning for business, planning cycle, create budget, review budget, concept of planning, planning process, approaches to planning, decision making. Developing a business plan, need for plan, concept, steps, business viability and justification, tips for preparing effective business plan.			
UNIT-V	Compliances & Introduction to Credit linkage	At the end of this unit student should be able to: <ul style="list-style-type: none"> •Taxation – Income Tax, Excise, Sales Tax •Export import licensing •Companies Act •Labor laws •Factories Act. •explain the various stages of business •infer the stage of your business •identify the types of finance one can avail at various stages •list the basic requirements for availing different types of finance 	Process of setting up a business enterprise, various types of forms for filing IT return, steps of e-filing IT returns, advance tax, tax deducted at source, ACES, export/ Import license, Pvt. limited company compliances. Financing for various business stages, sources of funding, basics of bank financing, classification of loans, special offering for SMEs, Challenges faced in finance, credit rating, CIBIL Score, Govt. schemes, Capital Market.	03		
UNIT-VI	Marketing.	At the end of this unit student should be able to: <ul style="list-style-type: none"> •differentiate between marketing and Sales •perform SWOT Analysis •devise the Marketing Mix for their products •explain the characteristics of MSME marketing 	Power of marketing, know your business-SWOT Analysis, and Know your customer, design your marketing mix, scale strategy after the sale, review and revision of business strategy.	02		

COURSE NAME: PROJECT WORK

COURSE CODE:

COURSE OUTCOMES:

After completion of course Student should be able to

- Understand clearly the tool design parameters of Tool Engineering.
- Design against standard and parameters
- Apply design principles to specific problem
- Interpret of output and confirming to specifications
- Collecting data related to design and manufacturing
- Communicate with manufacturing line.

THEORY HOURS:

PRACTICAL HOURS: 120

THEORY MARKS: 60

PRACTICAL MARKS: 60

Unit No.	Unit Name	Unit level outcomes	Contents (chapters/topics)	PR Hrs.	Marks	
UNIT-I		At the end of this unit student should be able to: <ul style="list-style-type: none">• Understand clearly the tool engineering parameters.• Explain various theoretical and practical aspect of Tool Engineering.• Understand the CAD/CAM Software like AUTOCAD, SOLIDWORK, and UNIGRAPHICS.	Projects On Design Of Press Tool and Design Of Mould Using Auto CAD For 2D Drawing, Solid work & Unigraphics CAD for 3d modeling and Unigraphics CAM for CAM Programming.	120	60	

