THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23ME301T	Machining Processes	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
The study of machine tools & metal cutting is fundamental to mechanical engineering. This course includes the working of mechanisms of various machine tools and machining principles. The learning outcomes includes concept of theory of metal cutting & force analysis, understanding the objectives of the various machine tools, constructional details and mechanisms involved in various machine tools. This course is aimed also to identify the machining parameters, different types of cutting tool materials, cutting fluids and their properties. Upon completion of this course, students shall understand the importance of machining processes and be able to apply the suitable machining processes for an engineering product.	• Demonstrate principle of metal cutting , machining parameters, Merchant force circle and estimate time for turning operation. • Illustrate lathe machine constructional details and the various operations performed on lathe machineand to estimate time for turning operation. • Demonstrate the Shaper , Slotter and Planer machine tool constructional details and the various operations performed on these machines. • Explain theconstructional details of Milling machine, Drilling machine ,boring machine, their types and the various operations performed on these machine • Compare and demonstrate the principle of unconventional machining and surface finishing processes.

Unit I **[8Hrs]**

Introduction to Machining Parameters: Introduction to machining, nomenclature and tool geometry of single point cutting tool, Theory of Metal Cutting: Introduction. Orthogonal and Oblique cutting. Mechanics of Metal Cutting, shear plane, Stress, Strain and cutting forces. Merchant's circle, Chip formation, cutting force calculations, Determination of Torque and power required for turning, Drilling and Milling. Influence of tool angle, cutting fluids, cutting speed, feed and depth of cut on power requirement, Estimation of tool life.

Unit II **[8Hrs]**

Lathe: Introduction. type, construction of simple lathe mechanism and attachments for various operations, machine specifications, basis for selection of cutting speed. feed and depth of cut, timeestimation for turning operation. Introduction to Capstan & Turret Lathe.

Unit III **[8Hrs]**

Shaper: Introduction, type, specification, description of machines, hydraulic drives in shapers, cutting parameters. Mechanism of shaper: Quick return mechanism, Crank & slotted link mechanism, Table feed mechanism, shaper operations, time estimation for shaping operations. Slotter : Introduction, specifications, description, type of drives for slotter, types of slotting machines -production slotter, puncher slotter, tool room slotter. Planer: Introduction,specifications, description. type of planner, open side planner, pit planner

Unit IV **[8Hrs]**

Milling: Introduction. Specification, types, column & knee type milling machine, fixed bed type milling machines, production milling machines, special purpose milling machines such as thread milling Machines, profile milling machine, Tool geometry & their specifications. Indexing- simple, compound and differential. Drilling: Introduction, classification of drilling machines. Boring, reaming, Broaching: Introduction, type of broaches, nomenclature of broaches. types of broaching machines.

Unit V **[8Hrs]**

Finishing Processes:Grinding wheel, grinding machines, fine finishing operations such as lapping, honing, polishing buffing , 'metal spraying, galvanizing and electroplating.Non-conventional Machining Processes Introduction, classification, water jet machining, chemical machining, electro- chemical machining, electrical discharge machining, non-conventional forming processes.

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Workshop Practice	H. S. Bawa		Tata Mc-Graw Hill
2.	Manufacturing Engineering & Technology	Kalpakjian		Pearson
3.	Modern Materials and Manufacturing Process	R. G. Bruce, J.E. Neely		Pearson Education

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Processes & Materials of Manufacturing	R. Lindberg		Allyn & Bacon
2.	Manufacturing Processes	M. Begman		

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23ME301P	Machining Processes Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
• To understand and demonstrate the basic principle of metal cutting operation • To understand the construction and the working mechanisms for different machine tools • To demonstrate the different machining operations on different machine tools.	• Apply various machining operations like plane turning,step turning,taper turning,grooving, boring,thread cutting etc. on the lathe machine on the cylindrical surface • Apply various machining operations like horizontal planing, angular cutting etc. on a flat surface on the shaper machine. • Apply drilling operation on tapered surface on the radial drilling machine. • Experiment with indexing i.e. Gear cutting operation on cylindrical surface on the milling machine. • Demonstrate surface grinding on flat machined surface on the surface grinding machine.

Minimum 8 practical to be performed

Expt. No.	Title of the experiment
1	Study and fabrication of Single Point Cutting Tool. (Wooden Material)
2	Study and calculations of Various forces on single point cutting tools.
3	Study and demonstration of multiple point cutting tools (milling, drilling)
4	Study and demonstration of operations on Lathe Machine.
5	Study and demonstration of operations on Shaper machine
6	Study and demonstration of operations on Milling machine
7	One Job on Milling
8	One Job on Drilling, Boring
9	One Job on Thread Cutting, Taper Turning
10	One Job on Surface Grinding
11	One Job on Shaper.

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Manufacturing Science	Ghosh & Mallik		East West Press
2.	Manufacturing technology (Metal cutting & Machine tools) Vol. II	P. N. Rao		Tata Mc-Graw Hill

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Introduction to Manufacturing Processes	J. A. Schey		Tata Mc-Graw Hill
2.	Workshop Technology (Volume II)	Hajra Chaudhary		Media Promoters & Publishers

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23ME302T	Engineering Thermodynamics	3	1	-	4	30	70	100

Course Objectives	Course Outcomes
• To describe the basic principles of classical thermodynamics and prepare them to apply them during heat and work interaction. • To enable the students to explain laws of thermodynamics, gas laws and apply it to various systems, note the significance of the results and to know about entropy. • To explain the properties of pure substance, their behaviors during various thermodynamic processes and working principles of calorimeters. • To explain working principle and significance of vapour power and various air standard cycles.	• Define the basic concepts of thermodynamics, represent different thermodynamic processes on P-V and T-s plots and analyze them using gas laws and compute associated heat and work interactions. • Explain First Law of thermodynamics and apply it to non-flow and flow processes. • Explain Second Law of thermodynamics and entropy, analyze the performance of heat pump, heat engine and refrigerator. • Describe the formation of steam, its characteristics and determine properties of steam using steam tables and Mollier chart. • Represent various air standard cycles and vapour power cycles such as Carnot, Otto, Diesel, and Rankine cycles on P-v and T-s plots, explain the different processes of these cycles and perform their thermodynamic analysis.

Unit I **[8 Hrs]**

Introduction to Thermodynamics, Fundamental Concepts and Definitions, Modes of energy transfer, heat and work, thermodynamic definition of work, internal energy, enthalpy, temperature, zeroth law of thermodynamics and its application.

Ideal Gas, Equation of state, Thermodynamic Processes, representation of these processes on P-v, T-s planes, First Law of Thermodynamics: First law applied to a system undergoing a process and a cycle.

Unit II **[8 Hrs]**

Application of first law of thermodynamics to non-flow processes, determination of work, heat, internal energy and enthalpy changes during the various thermodynamic processes.

First law applied to flow processes, general energy equation, steady flow energy equation on unit mass and time basis, application of SFEE for devices such as boiler, turbine, heat exchangers, pumps, nozzles, etc.

Unit III **[8 Hrs]**

Second Law of Thermodynamics: Limitations of the first law, Thermal Energy Reservoirs, definition of a heat engine, heat pump, refrigerator, thermal efficiency and the coefficient of performance. Kelvin-Planck and Clausius statements of the second law, their equivalence, reversible heat engine, Carnot theorems and corollaries. Carnot cycle, thermodynamic temperature scale.

Entropy: Entropy as a property, Clausius inequality, Principle of increase of entropy.

Unit IV **[8 Hrs]**

Pure Substance: Behavior of pure substance (steam) with reference to P-V, T-s and h-s diagrams, properties of steam, Sensible Heat, Latent Heat, Critical State, Triple Point, Wet Steam, Dry Steam, Superheated Steam, Dryness Fraction, saturation state, Quality of steam, its determination using various calorimeters. Steam tables and Mollier chart, Determination of properties of steam using steam tables and Mollier chart..

Unit V **[8 Hrs]**

Vapour power cycle, Introduction, vapour Carnot cycle, simple Rankine cycle, methods to improve the efficiency of simple Rankine cycle, Analysis of simple Rankine cycle. Air standard cycles, introduction to air standard cycles, Otto cycle, Diesel cycle, air standard efficiency, mean effective pressure, Analysis of air standard cycles.

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Engineering Thermodynamics	P.K. Nag		Tata McGraw-Hill Publishing Company Ltd.New Delhi
2.	Applied Thermodynamics	R.K, Rajput		Laxmi publications (P) Ltd, New Delhi

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	An Introduction to Thermodynamics	Y.V.C.Rao		Universities Press (India) Ltd

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23ME302T	Engineering Thermodynamics	3	1	-	4	30	70	100

LIST OF TUTORIALS

Sr. No.	Title
1	Units and their conversions
2	First law analysis of closed system executing a process and a cycle
3	First law analysis of open systems
4	Analysis of heat engine, heat pump and refrigerator
5	Thermodynamic analysis of different processes with steam as working fluid
6	Thermodynamic analysis of simple Rankine cycle
7	Thermodynamic analysis of Otto cycle
8	Thermodynamic analysis of Diesel cycle and Dual cycle

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23ME303T	Materials Engineering	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
Students will be able to understand the fundamentals and do structure property co-relation of various engineering materials. This course is aimed to understand,develop a fundamentals in selecting appropriate materials for industrial and engineering applications. Also, this course is aimed to built knowledge for development of properties using suitable heat treatment processess. This course also aims to compute the mechanical properties of engineering materials using various testing methods.	• Describe the fundamentals of various engineering materials, properties, their crystal structure and imperfection. • Compute the mechanical properties of engineering materials using various testing methods. • Interpret and explain the phase diagram and make use of this knowledge to illustrate the Iron-Iron carbide equilibrium diagram. • Realize the significance and general procedure of heat treatment processes. • Differentiate the composition, microstructure, properties and application of alloy steels, cast-iron and non metal alloys.

Unit I **[9Hrs]**

Introduction to engineering materials and their classification, mechanical properties of engineering materials, Non metals, Ceramics, Plastics, Nanomaterials, Refractory materials, Crystal structure – space lattice and unit cell,Miller indices, atomic packing factor, polymorphism, Imperfection in crystals: Point, line, interfacial and volume defects, Microscopic and macroscopic examinations of metals, Dislocations, strengthening mechanisms and slip systems, critically resolved shear stress.

Unit II **[9Hrs]**

Mechanical Property measurement: Tensile, compression, Young's modulus, relations between true and engineering stress-strain curves, generalized Hooke's law,yield strength, ductility, resilience, toughness and elastic recovery.Hardness test : Rockwell, Brinell and Vickers tests and their relation to strength. Introduction to nondestructive testing (NDT)

Unit III **[9Hrs]**

Alloys, solid solutions, Hume-Rothery's rules of solid solubility, Gibb's phase rule. Solidification of pure metal,Phase diagrams: Interpretation of binary phase diagrams and microstructure development; Iron Iron-carbide phase diagram and microstrctural aspects of austenite, ferrite and cementite, pearlite and ledeburite. Critical temperatures, invariant reactions.

Unit IV **[9Hrs]**

Heat treatment of Steel, Isothermal transformation (TTT) diagrams for Fe-C alloys and microstructure development. Continuous cooling curves (CCT) and interpretation of final microstructures and properties.Annealing, tempering, normalizing and hardening. Austempering, martempering, case hardening, carburizing, nitriding, cyaniding, carbo-nitriding, flame and induction hardening,

Unit V **[9Hrs]**

Classification of steel, Alloying of steel, properties of stainless steel and tool steels, maraging steels.Cast irons; grey, white, malleable and spheroidal cast irons. Copper and copper alloys; brass, bronze and Bearing Materials.Introduction to Powder metallurgy. International standards and codes for some commonly used steels for engineering applications (e.g. EN,IS, AISI,ASTM etc.).

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Material Science and Metallurgy for Engineers	V. D. Kodgire & S. V.Kodgire		Everest Publishing House.
2.	Introduction to Physical Metallurgy	Sindney H Avner		Mc-Graw Hill Education (India) Pvt. Ltd.
3.	Engineering Materials and Metallurgy	U. C. Jindal		Pearson

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Materials Science and Engineering-An Introduction	W. D. Callister	6th	Wiley India
2.	Engineering Materials	Kenneth G. Budinski and Michael K. Budinski	4th	Prentice Hall

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23ME303P	Materials Engineering Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
• Students will be able to learn and practice preparation, identification of micro structure. • Students will be able to compute the mechanical properties of engineering materials using various testing methods. • Students will be able to understand heat treatment process.	• Ability to identify phases and composition of various metals by metallographic examination using metallurgical microscope. • Ability to get experience on various heat treatment processes. • Ability to measure hardness of engineering materials. • Ability to understand working, principle and utilization of UTM to derive various material properties.

Minimum 8 practicals to be performed from following list

Expt. No.	Title of the experiment
1	To study the Metallurgical Microscopes
2	Preparation of specimen for metallographic examination.
3	Micro-structural examination of different types of Steels.
4	Micro-structural study of Meehanite alloy.
5	Micro-structural study of White Cast Iron and Grey Cast Iron.
6	Micro-structural study of Malleable Cast Iron and Nodular Cast Iron.
7	Measurement of hardness with the help of Rockwell Hardness Tester.
8	Measurement of hardness with the help of Brinell Hardness Tester.
9	Determination of tensile properties of ductile material.
10	Hardenability Test

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Introduction to Engineering Metallurgy	Rollason E.C		Edward Arnold publications
2.	Engineering Materials	Kenneth G. Budinski and Michael K. Budinski	4th	Prentice Hall of India

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Material Science and Engineering	V. Raghavan		Prentice Hall of India
2.	Materials Science and Engineering-An Introduction	W. D. Callister	6th	Wiley India

ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY,NAGPUR

(An autonomous institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

B. Tech. Scheme of Examination & Syllabus 2023-24

MECHANICAL ENGINEERING

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23ME304T	Machine Drawing	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
• To make students aware standard practices followed in machine drawing for creating 2-d detailing, assembly drawings and production drawings • To provide awareness about importance of machine drawing as engineers language for communication and career perspective. • To inculculate use of standard practises, ethics, symbols, GD&T in machine drawing.	• Represent conventional drawings of standard machine elements and intreprete meanings various symbols used in machine drawing. • Draw orthographic projections and sectional views of given machine components. • Explain importance of limit,fits and tolerances. Apply and intreprete and describe GD&T symbols in drawings. • Draw assembly views form given part drawings and part detailing from given assemby drawings. • Describe production drawings, read,intrepreteand describe prodcution drawings and blue print drawings.

Unit I	**[8Hrs]**
Conventional representations of Materials and standard machine components, standard features, Machining Symbols, Surface roughness symbols, Welding Symbols, Welded joints, Rivetted joints	
Unit II	**[8Hrs]**
Orthographic projection: Introduction, examples on orthographic projection of machine components (two and three views), dimensional detailing. Sectional Views: Introduction, types of sectional views, full and half sectional views, examples on sectional views of metal and plastic components.	
Unit III	**[8Hrs]**
Limits, Fits and Tolerances : Standards, types, fundamental deviation, applications and selection. Geometrical Dimensioning & Tolerances (GD&T): applications, indicating geometrical tolerences on drawings, feature controlled symbols, datum feature, tolerences of forms and shape	
Unit IV	**[8Hrs]**
Assembly drawing: Introduction, steps to prepare assembly drawings form detailing, examples on drawings assembly views from given part drawings, part list, balooning. Part drawing (assembly detailing): Introduction,steps to prepare part drawings from given assembly, examples on creating part detailing from given assembly drawings.	
Unit V	**[8Hrs]**
Production drawing: Introduction, types, process sheet, reading production drawings, examples on production drawings Blue print reading: Introduction, examples on reading and understanding blue prints of machine components, assemblies etc.	

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Machine Drawing	K. Narayana,P. Kannaiah, K. Reddy		New Age International
2.	Machine Drawing	N. D. Bhatt & V. M. Panchal		Charotar Publishing House
3.				

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Machine Drawing	N.Sidheshwar, Shastry, Kanhaiah		Tata Mcgraw Hill
2.	Fundamentals of Machine Drawing	Sadhu Singh, P. L. Shah		PHI Learning Pvt. Ltd
3.	Engg Graphics with AutoCAD	D. M.Kulkarni, A.P.Rastogi, A.K.Sarkar		PHI Learning Pvt. Ltd.

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23ME304P	Machine Drawing Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
• To make students aware standard practices followed in machine drawing for creating 2-d detailing, assembly drawings and production drawings • To provide awareness about importance of machine drawing as engineers language for communication and career perspective. • To inculculate use of standard practises, ethics, symbols, GD&T in machine drawing.	• Interpret and construct drawings of mechanical components and their assemblies. • Describe, identify and interpret symbols and notations related to machining, geometrical and dimensional tolerances. • Create Assembly drawings and detailing • Work in a group to perform reverse engineering drawings task. • Perform hands-on on CAD software tools for making digital drawings as per industrial practces.

LIST OF PRACTICALS

Minimum 5 practical to be performed

Experiment No.	Title of the Experiments
1	Conventional representation of standard machine components, joints, machining, surface roughness, welded joints symbols
2	Orthographics projection and Sectional Views of Component (manual drawing)
3	Orthographics projection and Sectional Views of Component (using CAD software)
4	Assembly drawings (Manual)
5	Assembly drawing (using CAD software).
6	Assembly detailing /part drawings (manual)
7	Assembly detailing /part drawings (using CAD software)
8	Production drawing with GD&T (manual)
9	Reverse Engineering (Student will be provided with actual physical part or assembly and will be asked to measure all relevant dimensions and then prepare 2-D detailing of part/ parts or assembly views if applicable)

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Machine Drawing	K. Narayana,P. Kannaiah, K. Reddy		New Age International
2.	Machine Drawing	N. D. Bhatt & V. M. Panchal		Charotar Publishing House

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Machine Drawing	N.Sidheshwar, Shastry, Kanhaiah		Tata Mcgraw Hill
2.	Fund. of Machine Drawing	Sadhu Singh, P. L. Shah		PHI Learning Pvt. Ltd
3.	Engg Graphics with AutoCAD	D. M.Kulkarni, A.P.Rastogi, A.K.Sarkar		PHI Learning Pvt. Ltd.

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23ME305P	Career Development-III	2	-	-	1	50	-	50

Course Objectives	Course Outcomes
1. To provides hands-on use of Microsoft Office applications like Word, Excel and PowerPoint. 2. To impart MS Office applications knowledge and skills. 3. To create foundation to prepare students for life-long learning of computer concepts and skills.	• Enter, import and edit data in Excel • Apply formulas and choose suitable functions as per the need. • Create and edit different types of charts • Manage and analyze data using sorting techniques and PivotTables • Generate What-If Analysis using Goal Seeking and Solver • Create and edit Word documents and PowerPoint presentations

Unit I	**[4Hrs]**
Introduction and key elements of Excel: Introduction to Excel, Basic Worksheet Operations, Entering, Editing and Formatting Worksheet Data, Formula basics and Operators Used in Formulas, Creating Your First Excel Workbook.	
Unit II	**[5Hrs]**
Data entry, Sorting, Functions and Conditional formatting: Using Forms for data entry, Working with Tables, Data sorting, Functions in Excel, Relative, Absolute, and Mixed referencing, Conditional formatting and analysis, Pasting in special ways.	
Unit III	**[6Hrs]**
Data analysis and visualization in Excel: Importing data and data validation, Creating different types of charts in Excel, Formatting different elements of charts, Making a Pivot table and filtering data, Creating Visualizations for the Dashboard, Adding Charts to Dashboard, Slicer.	
Unit IV	**[5Hrs]**
What-if analysis in Excel: What-if analysis, Scenarios, Goal-Seek, Solver and constraints, Using Solver for Maximization, Using Solver for Minimization, Introduction to Macros and VBA.	
Unit V	**[4Hrs]**
MS Word - Introduction to MS Word, Formatting Text, Lists, Paragraphs, Find and Replace, Spelling and Grammar, Printing. **Power Point -** Introduction to MS PowerPoint, Creating a Presentation, Views, Animations, Running a Slide Show, Printing.	

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Excel® 2019 Bible.	Michael Alexander, Dick Kusleika.	2019	John Wiley & Sons, Inc., Indianapolis, Indiana

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Office 2016 For Beginners- The perfect guide on Microsoft office Including Microsoft Excel Microsoft PowerPoint Microsoft Word Microsoft Access and more!	Steven Weikler	2016	Alpha Lifestyle Productions

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23ES301T	Value Education Course - I	2	-	-	2	15	35	50

Course Objectives	Course Outcomes
This course is intended ● To develop a holistic perspective through self-exploration and development of clarity about harmony between self, family, society and nature.	**Students will be able to** ● demonstrate awareness about concepts like self exploration & natural acceptance. ● understand concepts of aspirations and happiness. ● develop clarity of harmony and health in human being. ● discuss concepts of conservation of nature and harmony in nature/existence and re-usability.

Unit I : Introduction to Self-Exploration **[6Hrs]**

- Purpose & motivation for studying universal human values.
- Self-Exploration–what is it? - Its content and process.
- 'Natural Acceptance' and Experiential Validation- as the process for self-exploration.

Unit II: Understanding Happiness and Prosperity **[6Hrs]**

- Understanding Happiness and Prosperity correctly.
- Continuous Happiness and Prosperity- A look at basic Human Aspirations.
- Right understanding, Relationship and Physical Facility.
- Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

Unit III: Understanding Harmony in human being **[6Hrs]**

- Understanding human being as a co-existence of the sentient 'I' and the material 'Body'.
- Understanding the needs of Self ('I') and 'Body' - happiness and physical facility.
- Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer).
- Understanding the characteristics and activities of 'I' and harmony in 'I'.
- Understanding the harmony of I with the Body: Sanyam and Health.

Unit IV: Co-existing with nature **[6Hrs]**

- Understanding the harmony in Nature.
- Interconnection and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature.
- Understanding Existence as Coexistence of mutually interacting units in all-pervasive space.
- Holistic perception of harmony at all levels of existence.
- Pollution, depletion of resources and role of technology.

Text Books

Sr.No.	Title	Authors	Edition	Publisher
1	Human Values and Professional Ethics	Gaur, Sangal, Bagaria	2010	Excel Books, New Delhi

Reference Books

Sr.No.	Title	Authors	Edition	Publisher
1	Jeevan Vidya: Ek Parichaya	A. Nagaraj	1999	Jeevan Vidya Prakashan, Amarkantak
2	Human Values	A.N. Tripathi	2004	New Age Intl. Publishers, New Delhi
3	The Story of My Experiments with Truth	M.K.Gandhi	2009	Fingerprint! Publishers

Online Resources

1	https://fdp-si.aicte-india.org/UHV-II%20Class%20Note.php
2	https://fdp-si.aicte-india.org/UHV-II_Lectures_PPTs.php

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
23ME331M	MDM-I Orientation course on Entrepreneurship	2	-	-	2	15	35	50

Course Objectives	Course Outcomes
1. To strengthen business acumen and an entrepreneurial attitude in order to improve employment opportunities and cultivate entrepreneurial abilities. 2. To introduce the necessary skills to develop ventures beyond the idea/prototype stage.	1. Develop an entrepreneurial mindset by applying the five effectuation principles –Bird in hand Affordable Loss, Lemonade, Patchwork Quilt or Crazy Quilt, and Pilot-in-the-Plane. 2. Create your own business model using the Lean Canvas template.

Unit I **[8 Hrs]**

Self Discovery:Find your flow(passion), Principles of Effectuation, Selecting Venture Team. Opportunity Discovery: Identifying problem worth solving, Problem clarification - Understanding of the problem – Problem analysis - Reformulation of the problem - Observation Phase - Empathetic design - Tips for observing - Methods for Empathetic Design

Unit II **[8 Hrs]**

Design Thinking, Look for Solutions.Customer & Solution: Customers & Markets, Identify Market Segment and Niche Market, Identify Jobs, Pains & Gains and Early Adopters, Craft your Value Proposition Canvas, Problem Solution fit.

Unit III **[8 Hrs]**

Basics of Business Model and Lean Approach, Craft your Business Model(Lean Canvas), Risks & Assumptions, Pitching your Business Model.Validation: Blue Ocean Strategy, Building Solution Demo & Conducting Solution interviews, , Building an MVP(Minimum Viable Product).

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Innovation and entrepreneurship : practice and principles	Peter Drucker	1986	Allied Publishers
2.	Knowledge-Driven Entrepreneurship,The Key to Social and Economic Transformation	Andersson, Thomas, Formica, Piero, Curley, Martin G	2009	Springer book series

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Entrepreneurial Development	Khanna S.S.	2020	S. Chand Publications