ST. VINCENT PALLOTTI COLLEGE OF ENGINEERING & TECHNOLOGY, NAGPUR

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

B. Tech. Scheme of Examination & Syllabus 2025-26

MECHANICAL ENGINEERING

SEMESTER III

Sr No	Course Category	Course Code	Course Title	Hours per Week			Credits	Maximum Marks				Min Passing Marks	No. of Hrs for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total		
1.	PCC	25ME301T	Fluid Mechanics and Hydraulic Machines	3	-	-	3	20	20	60	100	45	3
2.	PCC	25ME301P	Fluid Mechanics and Hydraulic Machines Lab	-	-	2	1	-	25	25	50	25	-
3.	PCC	25ME302T	Engineering Thermodynamics	3	-	-	3	20	20	60	100	45	3
4.	PCC	25ME303T	Manufacturing Processes	3	-	-	3	20	20	60	100	45	3
5.	PCC	25ME303P	Manufacturing Processes Lab	-	-	2	1	-	25	25	50	25	-
6.	PCC	25ME304P	Machine Drawing Lab	-	-	4	2	-	25	25	50	25	-
7.	VEC	25ME305T	Environmental Science	2	-	-	2	10	10	30	50	23	1.5
8.	HSSM	25ME306T	Fundamentals of Economics and Management	2	-	-	2	10	10	30	50	23	1.5
9.	SEC	25ME341P	Career Development - I	-	-	2	1		50	-	50	25	-
10	MDM	25ME331M	MDM-I (Refer MDM basket)	2	-	-	2	10	10	30	50	23	1.5
			Total	**15**	**0**	**10**	**20**	**90**	**215**	**345**	**650**		

Multidisciplinary Minor - I	
25ME331M	Orientation course on Entrepreneurship

Chairman - BoS	Dean – Academics	July 2025	NEP 3.0	Applicable for 2026-27
		Date of Release	Version	

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25ME301T	Fluid Mechanics and Hydraulic Machines	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
1. To interpret basic concepts regarding the behavior of fluid. 2. To develop skill to analyze various hydraulic systems.	**Students will be able to:** 1. Define the fundamental properties of fluids and apply the concepts of fluids statics and fluid kinematics 2. Apply the principles of fluid dynamics and boundary layer concepts for fluid flow problems. 3. Analyze the fluid flow through pipes. 4. Illustrate the knowledge of working principles of hydraulic turbines. 5. Analyze the working principles of hydraulic pumps.

Unit I	**[9 Hrs]**
Fluid properties, fluid statics, pressure and measurement of pressure. Buoyancy and Flotation, Stability criterion. Fluid Kinematics: Flow visualization, lines of flow, types of flow, continuity equation (one dimensional differential forms)	
Unit II	**[9 Hrs]**
Fluid dynamics, equations of motion, Euler's equation along a streamline, Bernoulli's equation, its applications such as venturi meter, orifice meter, pitot tube, boundary layer theory. Condition for separation of boundary layer Introduction to CFD: Navier Stokes Equation, Necessity, limitations, philosophy behind CFD, Applications.	
Unit III	**[9 Hrs]**
Flow through pipes: Darcy-Weisbach's equation, friction factor, minor losses, flow through pipes in series and parallel, power transmission, Dimensional analysis.	
Unit IV	**[9 Hrs]**
Elements of Hydroelectric power plant, Hydraulic turbines, definition and classifications – Impulse and Reaction turbine - working principles, components, velocity triangles, Work done, specific speed, efficiencies, performance curves for turbines, Draft tube, Cavitation in turbines, Selection of turbines, similarity laws. Hydrodynamic forces on turbine blades.	
Unit V	**[9 Hrs]**
Pumps- classifications - Centrifugal pump- classifications, working principles, priming, velocity triangles, specific speed, efficiency and performance curves, multi-staging, operation in series and parallel, NPSH, submersible pumps, axial flow pump, reciprocating pump- classification, working principles, slip, performance curves and work saved by air vessels, cavitations in pumps, selection of pumps.	

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Fluid Mechanics–Fundamentals and Applications	Y. Cengel and Cimbala	3rd	Tata Macgrawhill Publishing
2.	A Textbook of Hydraulic Machines in SI Units (Fuid Mechanics and Hydraulic Machines Part –II	R.K, Rajput	Reprint 2012	Laxmi publications (P) Ltd

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Introduction to fluid mechanics and fluid machines	Som, S.K., Biswas G.	4th	Tata McGraw-Hill
2.	Fluid Mechanics and Hydraulics Machines	R.K Bansal	9th	Laxmi publications (P) Ltd

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25ME301P	Fluid Mechanics and Hydraulic Machines Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
1. To enable students to analyze the stability conditions of floating bodies and apply the Law of conservation of energy. 2. To enable students to verify fundamental principles like Bernoulli equation and continuity equation. 3. To enable students to apply concepts of frictional losses as well as estimate the performance characteristics of various hydraulic machines, including Pelton and Francis Turbines, and Centrifugal and Reciprocating Pumps.	**Student will be able to:** 1. Demonstrate and analyze the Stability condition of floating bodies and apply Law of conservation of Energy. 2. Determine Reynold's number, Frictional losses and Hydraulic co-efficients in the pipe flow. 3. Demonstrate the working of the Pelton and Francis turbine and to plot and analyze its performance characteristics. 4. Demonstrate the working of the Centrifugal & Reciprocating Pumps and to plot and analyze its performance characteristics.

Minimum eight experiments to be performed from the list

Expt. No.	Title of the experiment
1	Verification of Bernoulli's equation/Theorem
2	Determination of coefficient of discharge of a venturi meter
3	Determination of coefficient of discharge of an orifice meter
4	Determination of metacentric height of a ship model
5	Determination of frictional losses in pipes
6	Determination of Reynolds Number
7	Estimation of performance characteristics of reciprocating pimp
8	Estimation of performance characteristics of Centrifugal pump
9	Estimation of performance characteristics of Pelton Wheel Turbine
10	Demonstration of Francis Turbine

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Fluid Mechanics	Yunus A.Cengel& John M. Cimbla		Tata McGraw Hill Publishing Company Ltd. New Delhi.
2.	Hydraulic and Fluid Mechanics	P.N. Modi and S.M.Seth		Standard BookHouse

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Fluid Mechanics	Victor L Streeter, E Benjamin Wylie		McGraw Hill International
2.	Engineering Fluid Mechanics	K.L. Kumar		S. Chand & Company Ltd

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25ME302T	Engineering Thermodynamics	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
1. To describe the basic principles of classical thermodynamics and prepare them to apply them during heat and work interaction. 2. To enable the students to understand laws of thermodynamics, gas laws and apply it to various systems, note the significance of the results and to know about entropy. 3. To explain the properties of pure substance, their behaviors during various thermodynamic processes and working principles of calorimeters. 4. To explain working principle and significance of vapour power and various air standard cycles.	**Students will be able to:** 1. 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. 2. Explain First Law of thermodynamics and apply it to non-flow and flow processes. 3. Explain Second Law of thermodynamics and entropy, analyze the performance of heat pump, heat engine and refrigerator. 4. Describe the formation of steam, its characteristics and determine properties of steam using steam tables and Mollier chart. 5. 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	[9Hrs]
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	**[9Hrs]**
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	**[9Hrs]**
Second Law of Thermodynamics: Limitations of the first law, Thermal Energy Reservoirs, definition of a heat engine, heat pump, refrigerator, thermal efficiency and the co-efficient 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. Thermodynamic analysis of heat engine, heat pump and refrigerator. Entropy: Entropy as a property, Clausius inequality, Principle of increase of entropy.	
Unit IV	**[9Hrs]**
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	**[9Hrs]**
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	6th	Tata McGraw-Hill Publishing Company Ltd., New Delhi
2.	Engineering Thermodynamics	R.K. Rajput	5th	Laxmi publications (P) Ltd, New Delhi

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	An Introduction to Thermodynamics	Y.V.C.Rao	Revised	Universities Press (India) Ltd
2.	Thermodynamics - An engineering approach	Yunus A. Cengel , Michael A. Boles	9th	Tata McGraw-Hill

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25ME303T	Manufacturing Processes	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
1. This course is designed to provide students with an overview of a wide variety of manufacturing processes for processing of engineering materials. 2. Students will learn principles, operations and capabilities of various molding, metal casting, metal joining processes **3.** In this course, students shall understand the importance of manufacturing processes and be able to select and apply suitable processes for an engineering product.	**Students will be able to:** 1. Describe principles, operations and capabilities of various molding, metal casting processes. 2. Select appropriate welding or allied process & set correct welding parameters for the given components. Identify welding defect & correct the required parameter. 3. Identify various rolling &forging processes as per applications. 4. Describe principles, operations and capabilities of various presses and dies. 5. Illustrate appropriate process for the manufacture of the given plastic components.

Unit I	**[9Hrs]**
Pattern Making & Moulding: - Pattern making: Types, materials used, Pattern making allowances, color codes. Core making: - Types, core material & its properties. Moulding: Types of sand moulds, moulding sand composition. moulding sand properties, moulding machines. Shell moulding, Gating System & Casting Processes: - Elements of gating systems, Melting furnaces -Types, Electric furnace, Cupola construction & operation. Special casting processes such as investment Casting, Centrifugal Casting,Die Casting, Lost foam Process Casting , Chemical Bonded Castings process.	
Unit II	**[9Hrs]**
Joining Processes: - Introduction to metal Joining- Types of Welding. Arc Welding & Gas Welding Processes, Defects & Inspection of Welding Joints, Electrodes, weldability of Metals, Welding equipments. Fixtures, TIG Welding, MIG Welding, Spot Welding Soldering and brazing, Thermit welding.	
Unit III	**[9Hrs]**
Forming Process for metals:- Rolling, Forging, Extrusion, Drawing, Mechanics of forming process, Types of rolling mills, Forging equipment ,Extrusion processes and various drawing operations.	
Unit IV	**[9Hrs]**
Sheet Metal Working: Introduction, Punches and dies, sheet metal working operations: piercing and punching, blanking, notching, beading, perforating, slitting, lancing, mechanism of blanking, drawing, coining, embossing, wire drawing, metal spinning operations, bending, forming and drawing.	
Unit V	**[9Hrs]**
Processing of Plastic: Introduction, general properties and applications, types of plastic, thermosetting plastic, thermo-plastic plastics. Methods of processing plastics: compression molding, injection molding, extrusion, Calendaring, wire drawing.	

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Manufacturing technology (Vol. I)	P. N. Rao,		Tata Mc-Graw Hill
2.	Manufacturing Engineering & Technology	Kalpakjiani		Pearson
3.	Modern Materials and Manufacturing Process,	R. Gregg Bruce, John E. Neely		Pearson Education
4	Workshop Technology Volume I	S.K.Hajra Chaudhary ,A.K.Hajra Chaudhary		Media Promotors & Publishers Pvt Ltd,.

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Manufacturing Science,	Ghosh & Malik,		East West Press.
2.	Processes & Materials of Manufacturing,	R. Lindberg, Allyn & Bacon.		

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THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25ME303P	Manufacturing Processes Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
1. To understand and demonstrate the basic principle of manufacturing processes. 2. To understand and describe casting, joining and forming processes 3. To demonstrate the skills for pattern making, casting and welding.	**Students will be able to:** 1. Perform various tests on the molding sand sample such as compressive strength testing, permeability test, moisture testing etc. To know the properties of the molding sand. 2. Make Pattern from the given component drawing or component. 3. Make complete mold from various types of patterns like single piece, split,etc. 4. Preparing edges for joining thick plates by M.I.G welding, setting welding parameters such as current, inert gas pressure & job setting. 5. Demonstrate how to melt metal in the furnace & pour the molten metal in the mold.

Minimum 8 experiments to be performed

Expt. No.	Title of the experiment
1	To perform the compressibility strength test on molding sand.
2	To determine the permeability number of green sand.
3	To determine the percentage of moisture content in the green sand.
4	Preparation of green sand mold using single piece pattern.
5	Preparation of green sand mold using double piece pattern.
6	Preparation of Single piece wooden Pattern (one job)
7	Demonstration and preparation of welding joint with arc welding and MIG welding
8	Demonstration of Casting process
9	Visit to Foundry Industry
10	Virtual Lab: https://msvs-dei.vlabs.ac.in/ajay/mpfclab.html

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Manufacturing technology (Vol. I)	P. N. Rao,		Tata Mc-Graw Hill
2.	Manufacturing Engineering & Technology	Kalpakjian		Pearson
3.	Modern Materials and Manufacturing Process	R. Gregg Bruce, John E. Neely		Pearson Education

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Manufacturing Science,	Ghosh & Malik,		East West Press.
2.	Processes & Materials of Manufacturing,	R. Lindberg, Allyn & Bacon.		

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25ME304P	Machine Drawing Lab	-	-	4	2	25	25	50

Course Objectives	Course Outcomes
1. To make students aware of standard practices followed in machine drawing for creating 2-D detailing, assembly drawings and production drawings. 2. To provide awareness about importance of machine drawing as engineers' language for communication and career perspective. 3. To inculcate application of standard drafting practices, symbols, Geometric Dimensioning & Tolerances in machine drawing.	**Students will be able to:** 1. Identify, Describe and interpret symbols and notations related to machining processes, geometrical dimensioning and tolerances. 2. Apply principles of sectional views and surface development to draw and construct sections and developments of solids. 3. Interpret Isometric drawings and construct Orthographic projections and sectional views of machine components. 4. Construct the Assembly drawings and Part drawing of machines and machine components. 5. Create digital drawing using CAD software tools as per industrial practices.

LIST OF PRACTICALS

Minimum 8 practical to be performed

Experiment No.	Title of the Experiments
1	Conventional representation of Materials, standard machine components, forms of threads, joints, machining, surface roughness and welded joints symbols.
2	Section of solids and development of lateral surface of solids. (Manual Drawing)
3	Orthographic projection and Sectional Views of Component (Manual drawing)
4	Orthographic projection and Sectional Views of Component (Using CAD software)
5	Assembly drawings. (Manual drawing)
6	Assembly drawing. (Using CAD software).
7	Assembly detailing /part drawings. (Manual drawing)
8	Assembly detailing /part drawings. (Using CAD software)
9	Production drawing with Geometric Dimensioning &Tolerances. (Manual drawing)
10	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	2012	New Age International
2.	Machine Drawing	N. D. Bhatt & V. M. Panchal	2015	Charotar Publishing House

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Machine Drawing	N.Sidheshwar, Shastry, Kanhaiah	2015	Tata Mcgraw Hill
2.	Fund. of Machine Drawing	Sadhu Singh, P. L. Shah	2017	PHI Learning Pvt. Ltd
3.	Engg Graphics with AutoCAD	D. M.Kulkarni, A.P.Rastogi, A.K.Sarkar	2016	PHI Learning Pvt. Ltd.

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B. Tech. Scheme of Examination & Syllabus 2026-27

ENGINEERING, SCIENCES & HUMANITIES

THIRD SEMESTER/ FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25ME305T	Environmental Sciences	2	-	-	2	20	30	50

Course Objectives	Course Outcomes
This course is intended 1. **To provide knowledge** of natural resources, their classification, utilization, and the importance of conservation for sustainable development. 2. **To create awareness** about climate change issues such as global warming, ozone depletion, acid rain, and their environmental impacts along with mitigation strategies. 3. **To introduce** the fundamental concepts of **Sustainable Science** and promote awareness of eco-friendly technologies	**Students will be able to** 1. Describe natural resources, their classification, and the importance of conservation, including the role of individuals and public awareness in sustainable resource management. 2. Analyze climate change and assess their environmental impacts and mitigation strategies. 3. Examine different types of environmental pollution, their causes, effects, and control measures, along with solid waste management practices and disaster management techniques. 4. Apply concepts of sustainable practices to evaluate environmentally friendly materials, processes, and technologies in engineering applications

UNIT I – Natural Resources & Climate Changes **[10 Hrs.]**

Natural Resources- Definition, scope and importance; Need for public awareness -Institutions in environment, people in environment. Renewable and non-renewable and associated problems; Role of an individual in conservation of natural resources; equitable use of resources for sustainable lifestyles. Conservation of biodiversity**:** In-situ and Ex-situ conservation of biodiversity. **Climate Changes** Global warming and greenhouse effect, Climate change impacts and mitigation strategies.

UNIT II - Environmental Pollution **[10 Hrs.]**

Definition Cause, effects and control measures of a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards. **Solid waste Management:** Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. **Disaster management:** floods, earthquake, cyclone and landslides, Ozone layer depletion, Acid rain.

UNIT II – Sustainable Science **[10 Hrs.]**

Introduction, Principles of Green Chemistry with example, Green Reagents- Super Critical Fluid (CO2)- Properties and Applications, Green Building-Introduction, Components, Reuse and safety of building material and its environmental impact., Green Crackers- Introduction, Advantages. Carbon Credit, Carbon Sequestration, Carbon Capture and Storage CCS.

Reference Books-

S.N	Title	Authors	Edition	Publisher
1	Environmental Problems and solutions	D.K.Asthana,Mira Asthana		S.Chand.
2	Bio-Diversity	M.S.Swaminathan		Macmillan India Ltd.
3	Essentials of Ecology & Environmental Science	Rana		Prentice Hall of India
4	Environmental Chemistry	A.K.De		New Age International
5	Environmental Pollution Monitoring & Control	Khopkar S. M.		New Age International

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THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25ME306T	Fundamentals of Economics and Management	2	-	-	2	10	10	30	50

Course Objectives	Course Outcomes
1. The course examines how the economics, business and industrial management practices are related and how business decision is taken.	**Students will be able to:** 1. Apply economic principles for business decisions by understanding production cost relationships 2. Assess impact of macroeconomics and government policies on business and economy. 3. Recognize key management, marketing, and financial functions and their role in effective business decision-making

Unit I	**[10Hrs]**
Economics, Classification of economics, Industrial economics, Consumer demand, Law of Demand, Determinants of demand, Demand forecasting, Law of supply, Types of Elasticity of demand, Concept of Production, Factors of Production, types of cost, cost curves.	
Unit II	**[10Hrs]**
Market Structures: Perfect competition, Monopoly, and Monopolistic competition, Functions of central bank, Inflation, Deflation, Recession, National income, GDP, GNP, Liberalization, Privatization and Globalization	
Unit III	**[10Hrs]**
Definition of management, functions of management, Functions of human resources Management, Marketing Management, Functions of Marketing Management. Methods of pricing, advertising and sales promotion. Financial Management, functions of financial management, Sources of finance.	

Text Books

S. N	Title	Authors	Edition	Publisher
1.	Managerial Economics	D.N. Dwivedi	8th	Vikas Publishing
2.	Modern Economic Theory	K.K. Dewett	2005	S. Chand Publisher
3.	Industrial Management	Dr.I.K. Chopde, Dr.A.M. Sheikh	Revised edition	S. Chand Publisher

Reference Books

S. N	Title	Authors	Edition	Publisher
1.	Industrial Organization and Industrial economics	T.R. Banga, S.C. Sharma	2006	Khanna Publishers

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
25ME341P	Career Development – I	-	-	2	1	50	-	50

Course Objectives	Course Outcomes
1. To ignite the importance of aptitude skill development for better career prospects. 2. To develop analytical and aptitude skills for preparation of competitive exams and placement drives.	1. Solve analytical questions on numbers, ratio and proportion, simple and compound interest by application of mathematical concepts. 2. Disgusting and select correct alternative for verbal and non-verbal questions on series and analogy. 3. Analyze the given data and frame equations for percentage, profit & loss and partnership problems.

Topics to be covered

Topic No.	Topic
1	Numbers (Part-1: Divisibility Test, LCM / HCF Problems)
2	Numbers (Part-2: Factorization, Remainder Theorem)
3	Numbers (Part-3: Power Cycle, Successive Division)
4	Analogy (Number / Letter / Word / Nonverbal analogy)
5	Number and Letter Series
6	Simple Equations
7	Ratio, Proportion & Variation
8	Percentage, Profit & Loss
9	Partnership Problems
10	Simple & Compound Interest

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Quantitative Aptitude for Competitive Examinations.	R.S.Agrawal	2025	S.Chand & Company
2.	Quantitative Aptitude	Shripad Deo	2014	Allied Publishers

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	A modern approach to verbal and non verbal reasoning.	R.S.Agrawal	2025	S.Chand & Company
2.	Verbal & Non-verbal reasoning	Neeraj Kumar	2022	NRBC Publishers

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MECHANICAL ENGINEERING

THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
25ME331M	MDM – I Orientation Course on Entrepreneurship	2	-	-	2	10	10	30	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.	**Students will be able to:** 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. Apply Design Thinking to identify user needs and define real-world problems from a human-centered perspective. 3. Create your own business model using the Lean Canvas template.

Unit I	**[10 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	**[10 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	**[10 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, TheKey to Social and Economic Transformation	Andersson, Thomas, Formica, Piero, Curley, MartinG	2009	Springer book series

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Entrepreneurial Development	Khanka S.S.	2020	S. Chand Publications
2.	Effectual Entrepreneurship	Stuart Read, Saras Sarasvathy, Nick Dew, Robert Wiltbank, and Anne-Valérie Ohlsson	2016	Routledge