SEMESTER IV

SrNo	Course Category	Course Code	Course Title	Hours per Week			Credits		Maximum Marks			No of Hours for ESE
				L	T	P		Mid-Sem Examination	Continual Assessment	End Sem Examination	Total	
1.	PCC	**24ME401T**	Fluid Mechanics and Hydraulic Machines	**3**	**-**	**-**	**3**	**20**	**20**	**60**	**100**	**3**
2.	PCC	**24ME401P**	Fluid Mechanics and Hydraulic Machines Lab	**-**	**-**	**2**	**1**	**-**	**25**	**25**	**50**	**-**
3.	PCC	**24ME402T**	Strength of Materials	**3**	**-**	**-**	**3**	**20**	**20**	**60**	**100**	**3**
4.	PCC	**24ME402P**	Strength of Materials Lab	**-**	**-**	**2**	**1**	**-**	**25**	**25**	**50**	**-**
5.	PCC	**24ME403P**	Mechatronics Lab	**-**	**-**	**2**	**1**	**-**	**25**	**25**	**50**	**-**
6.	PCC	**24ME404P**	Mechanical Measurements Lab	**-**	**-**	**2**	**1**	**-**	**25**	**25**	**50**	**-**
7.	VSC	**24ME405P**	Technical Skill Development-I	**-**	**-**	**4**	**2**	**-**	**50**	**-**	**50**	**-**
8.	ELC	**24ME406P**	Micro Project-II*			**2**	**1**	**-**	**50**	**-**	**50**	**-**
9.	AEC	**24ME407T**	Value Education Course	**3**	**-**	**-**	**3**	**20**	**20**	**60**	**100**	**3**
10.	SEC	**24ME441P**	Career Development-IV		**-**	**2**	**1**	**-**	**50**	**-**	**50**	**-**
11.	MDM	**24ME431M**	Multi-Disciplinary Minor-II	**3**	**-**	**-**	**3**	**20**	**20**	**60**	**100**	**3**
Total				**12**	**0**	**16**	**20**	**80**	**330**	**340**	**750**	

*** Field Project or Community engagement project in the major discipline**

Multi-Disciplinary Minor-II	
24ME431M	Project Management

		July 2025	**NEP 2.1**	**Applicable for 2025-26**
Chairman - BoS	**Dean – Academics**	**Date of Release**	**Version**	

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24ME401T	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

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ME401P	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

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24ME402T	Strength of Materials	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
1. This course is designed to understand the basic concepts of stress, strain and their variations under different types of loading and temperature conditions. 2. The course enables students to know about bending moment, shear force, stresses in beams, slope and deflection in beams under different loading and support conditions. 3. The course helps in understanding of torsional shear stress in shaft, crippling load in struts and columns and applying different theories of failure for designing. 4. The course concludes with learning the design procedure for helical and leaf spring along with concepts of pressure vessel design.	**Student will be able to:** 1. To make use of relations between stress, strain and elastic modulus for various types of loads, geometry and materials for evaluating stress. 2. To construct shear force & bending moment diagram for different types of beams subjected to various load conditions and estimate the deflection along with stresses induced. 3. To apply torsion theory for shafts, column theories for columns and evaluate instantaneous strain energy stored due to impact. 4. To locate position of principal plane along with principal stresses and determine the size of part by applying different theories of failure. 5. To design different types of spring under static loads and apply the basic concepts used design of pressure vessels.

Unit I **[9 Hrs]**

Concept of simple stresses and strains: Introduction, stress, strain, types of stresses, stress and strain diagram for brittle & ductile material, elastic limit, Hooks law, modulus of elasticity, modulus of rigidity, bulk modulus and factor of safety. Analysis of simple rod, tapered rod, varying cross section rod and composite section. Poisson's ratio, Volumetric strain with tri-axial loading. Thermal stress and strain in simple rod, varying cross section rod and composite bars.

Unit II **[9 Hrs]**

Shear force and bending moment: Types of beam (cantilever, simply supported and overhang beam). Types of loads (Concentrated and UDL). Shear force and bending moment diagrams for beams subjected to loads as well as couple.
Stresses in beams: Theory of simple bending with assumptions and expressions for bending stress.
Deflection of beams: Deflection & slope of cantilever, simply supported, overhang beams subjected to concentrated load and UDL.

Unit III **[9 Hrs]**

Torsion of circular shafts: Derivation of torsion equation with the assumptions made in it. Strength and rigidity criteria for design of shaft. Torque transmitted by solid and hollow circular shaft.
Column and Struts: Failure of long and short column, slenderness ratio, Euler's column theory & end conditions for column. Limitations of Euler's theory. Crippling load for various end conditions in column by Euler's theory & Rankine's theory.
Strain energy and impact loading: Expression for strain energy stored in a body when it is subjected to gradually applied load, suddenly applied loads and impact loads.

Unit IV **[9 Hrs]**

Principal stresses and strains: Principal planes & principal stresses. Analytical and Mohr's circle method of determining stresses on oblique section when member is subjected to shear stress and direct stresses in two mutually perpendicular directions.
Theories of failure and its application in designing a machine part subjected to static load. Introduction to fatigue failure, endurance limit, modes of fracture, creep phenomenon.

Unit V **[9 Hrs]**

Design of Springs: Helical compression & tension springs under static loads and Leaf spring design.
Pressure Vessel: Basic concepts in designing of pressure vessels, stresses induced in thin cylindrical shells and its failure.

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Strength of Materials	R K Bansal	2018	Laxmi Publications
2.	Strength of Material	R.K. Rajput	2019	S.Chand Publication

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Mechanics of Material	Beer & Johnson	2018	Tata Mc-Graw Hill
2.	Machine Design	U.C. Jindal	2019	Pearson Publications

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ME402P	Strength of Material Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
1. This course is designed to learn the basic concepts of stress, strain and their variations under different types of loading and temperature conditions. 2. This course includes application of bending theory for beams under different loading and support conditions. **3.** This Course enables to learn the torsional shear stress in shaft, and strain energy with impact loading in failure of component.	Student will be able to: 1. Perform the procedure of material testing especially in tension, compression, shear and bending. 2. Plot the load v/s deflection graph for materials to determine elastic constants like Young's Modulus and Shear Modulus with the help of experimentation. 3. Know the breaking strength for materials in different loading conditions. 4. Get familiarized with the procedure to determine strain energy absorbed in a body before getting fracture due to impact loading. 5. Determine the hardness number of any metal / non-metal by penetration test.

LIST OF EXPERIMENTS

Minimum 8 Practical's to be performed

Exp. No.	Title of the Experiment
1	To perform Tensile Test on metal rod
2	To perform Compression Test on metal block
3	To perform Shear Test on metal rod
4	To perform Rockwell hardness test of metal
5	To perform Brinell hardness test of metal
6	To perform torsion test of a steel shaft
7	To perform impact test on a wooden specimen
8	To perform bending test on simply supported beam
9	To perform deflection test on helical spring

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Strength of Materials	R K Bansal	2018	Laxmi Publications
2.	Strength of Materials	Ramamurtham	2016	DhanapatRai Publication
3.	Strength of Material	R.K. Rajput	2019	S.Chand Publication

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Mechanics of Material	Beer & Johnson	2018	Tata Mc-Graw Hill
2.	Machine Design	U.C. Jindal	2019	Pearson Publications

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ME403P	Mechatronics Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
1. To provide hands-on experience on the development of data acquisition system by properly selecting sensor, signal conditioning unit, signal processing unit. 2. To provide design and development of the concepts hydraulic and pneumatic actuation elaborating a role of direction control valves in development of logic. 3. To provide hands-on experience of various types of sensors, their working principles and applications. 4. To provide experiential learning on working of PLC including elements, ladder logic and hardware & software interface.	**Student will be able to:** 1. Choose appropriate sensors to measure a physical quantity by considering various constraints of measurement. 2. Develop pneumatic / hydraulic circuit for given application using actuators and control valves. 3. Demonstrate the Implementation of ladder diagram, programming using PLC to develop a new mechatronics application. 4. Develop a measurement system using data acquisition system by properly selecting sensor, signal conditioning unit, signal processing unit.

Minimum 8 experiments to be performed from the list.

Expt. No.	Title of the experiment
1	Performance based on the working of Digital-to-analog conversion.
2	Performance based on the working of Analog-to-digital conversion.
3	To design & develop a measurement system using single-channel Data Acquisition System & LabVIEW software.
4	To design & develop a measurement system using multi-channel Data Acquisition System on multi-functional machine fault simulator.
5	Performance based on pneumatic/hydraulic cylinder using single acting cylinder.
6	Performance based on pneumatic/hydraulic cylinder using double acting cylinder.
7	Performance based on distance measurement sensor.
8	Performance based on weight measurement sensor
9	Performance based on displacement measurement sensor
10	Peformance based on proximity sensor (Inductive & Capacitve)
11	Development of ladder diagram, programming using PLC for Lift / elevator control.
12	Development of ladder diagram, programming using PLC for elecro-hydraulic system.

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Mechatronics	W. Bolton	Fourth edition	Pearson Education Ltd
2.	Mechatronics Integrated Mechanical Electronics Systems	K P Ramchandran, G k Vijayaraghavan, m S Balasundaram	First edition (2008)	Wiley

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Mechatronics	HMT Ltd	Third Edition (Kindle Edition)	Tata McGraw- Hill
2	Introduction to Mechatronics	Appu kuttan K.K	First edition (2007)	Oxford University Press

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ME404P	Mechanical Measurements Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
1. The goal of this course is to help you comprehend the fundamentals of Examine and differentiate between the various measurement systems' functional components. 2. To measure linear and angular displacement, speed, and linear and angular dimensions, 3. Conduct experiments utilizing a variety of electromechanical equipment. Additionally, measure screw thread and flatness through tests using a comparator and various precision tools.	**Student will be able to:** 1. Analyze and identify various functional elements of different measuring systems. 2. Experiment with various Electromechanical Instruments for measurement of linear and angular displacement, speed, and temperature. 3. Experiment with comparator and various precision Instruments for measurement of linear and angular dimensions, screw thread and flatness.

LIST OF EXPERIMENTS

Minimum 8 practicals to be performed

Experiment No.	Title of Experiment
1	To Identify the functional elements of measuring system
2	Measurement of Linear displacement using LVDT
3	Measurement of angular displacement using capacitive pick up
4	A) Measurement of speed using photo electric pickup B) Measurement of speed using Stroboscope
5	Measurement of temperature using RTD
6	A) Linear measurement using Vernier & micrometer gauges B) Measurement of taper angle using Sine bar
7	Measurement of threads parameters using Tool maker's microscope
8	Measurement of threads parameters using Optical Profile Projector
9	Performance of Optical flat for flatness measurement using virtual lab
10	Performance of Pneumatic Comparator using virtual lab

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Mechanical Measurement and Control	D.S. Kumar		Metropolitan Book Co.
2.	Instrumentation Measurement and Analysis	B.C. Nakra, K.K. Choudhary		TMH

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Principles of Measurement Systems	John P. Bentley		Pearson Publications
2.	Mechanical Measurement	Thomas G. Beckwith		Pearson Publications

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ME405P	Technical Skill Development – I	-	-	4	2	50	-	50

Course Objectives	Course Outcomes
1. To demonstrate the basic understanding of design process 2. To prepare wireframe models of basic engineering structures. 3. To effectively use wireframe models for generation of surface model	**Student will be able to:** 1. Explain the design construction of basic engineering structures. 2. Identify approaches for surface modeling of basic engineering problems.

Problem Statement: Design simple wireframe model and surface model for given problem statements

Expt. No.	Title of the experiment
1	Evaluate vertex coordinates and create points using the coordinates for the proposed design
2	Using points generate line.
3	Using lines generate line geometry (wireframe)
4	Edit lines and line geometry to reconstruct wireframe.
5	Using lines generate surfaces
6	Edit surfaces to add features like curves, splines, fillets, washers, trims etc
7	Use 'extrude' to generate surfaces from line geometry (curves, splines, fillets etc)
8	Using surfaces create volume (surface model)
9	Edit surfaces to recreate surface model

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Fundamental Concepts of Geometry	Bruce E. Meserve	-	Dover books
2.	The Foundation of Geometry	David Hilbert	1st	MJP Publisher

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Finite Element Modeling (Hyperworks engineering guide books)	FU YA LAN. XIE SU MING	1st	China Water Power Press
2.	eLearning resources https://altairuniversity.com/	Altair	-	Altair University

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ME406P	Micro Project - II	-	-	2	1	50	-	50

Course Objectives	Course Outcomes
1. To enable students to develop Problem-solving and analytical thinking. 2. To look for Field Project or Community engagement project in the major discipline 3. To enable students to develop the skill of effective oral communication and technical documentation writing. 4. To enable students to develop collaboration and team work spirit in project conduction. 5. Use of engineering design software and simulation tools.	**Students will be able to:** 1. Acquire the ability to generate, develop and evaluate ideas by synthesizing information from a variety of sources so as to apply these skills to the project task. 2. Illustrate the ability of critical thinking for problem solving. 3. Build collaborative skills and interpersonal relationship through working in a team to achieve common goals

Module 1 : Introduction to Project its Planning and management

- Introduction to [understanding of community-based projects.
- Overview of project management principles.
- Project scope, objectives and constraints.
- Work break down structure

Module 2 : **Literature review**

- Introduction to types of literature and their sources
- Literature management
- Methodology to Conduct a thorough literature review related to the chosen project area
- Identify existing solutions and research gaps
- Compiling findings of literature review

Module 3: Result **Discussions, and Conclusion**

- Performing analysis and documentation of results.
- Discussions on the significance of findings.
- Conclusion based on analysis and potential future work or applications.

Module 4: **Report Writing and Documentation**

- Preparation of the final project report:
- Abstract.
- Introduction, problem statement, objectives.
- Literature review, methodology, results, and discussion.
- Conclusion, references, and appendices (if any).
- Proper formatting and presentation of the document.

Module 5: **Project Presentation and Viva**

- Final project presentation to a panel of faculty members.
- Demonstration of the project work.
- Answering viva questions regarding methodology, results, and implementation.
- Submission of final reports and any prototypes (if applicable).

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Research Methodology	Kothari C..R.		New Age International Pvt Ltd Publishers

Reference Books

S.N	Title	Authors	Edition	Publisher

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FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24ME407T	Value Education Course	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
• Development of a holistic perspective through self-exploration and development of clarity about harmony between self, family, society and nature.	**At the end of the course, students will be able to:** 1. Demonstrate awareness about self and their surroundings and its interdependence. 2. Distinguish between the concepts of aspirations and happiness. 3. Recognize and explain the nine universal values in relationship and their application in visualizing a harmonious society. 4. Discuss concepts of conservation of nature and harmony and reusability. 5. Identify the scope of eco-friendly systems for enriching institutions.

Unit I : Introduction	**[9Hrs]**
Purpose and motivation for the course, Self-Exploration–what is it? - Its content and process; 'Natural Acceptance' and Experiential Validation- as the process for self-exploration, Continuous Happiness and Prosperity- A look at basic Human Aspirations , Right understanding, Relationship and Physical Facility- the basic requirements for fulfillment of aspirations of every human being with their correct priority , Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario , Method to fulfill the above human aspirations: understanding and living in harmony at various levels.	
Unit II : Understanding Harmony	**[9Hrs]**
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; correct appraisal of Physical needs, meaning of Prosperity in detail , Programs to ensure Sanyam and Health.	
Unit III : Values in relationships	**[9Hrs]**
Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfillment to ensure mutual happiness; Trust and Respect as the foundational values of relationship , Understanding the meaning of Trust; Difference between intention and competence , Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship , Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals , Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.	
Unit IV : Co-existing with nature	**[9Hrs]**
Understanding the harmony in Nature, Interconnectedness 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. Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.	
Unit V : Holistic approach for engineers	**[9Hrs]**
Natural acceptance of human values , Definitiveness of Ethical Human Conduct , Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order , Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems. , Case studies of typical holistic technologies, management models and production systems , Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations ,Sum up	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Human Values and Professional Ethics	Gaur, Sangal, Bagaria	2010	Excel Books, New Delhi

Reference Books

S.N	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

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24ME441P	Career Development – IV	-	-	2	1	50	-	50

Course Objectives	Course Outcomes
1. The sole objective of imparting aptitude training is to make students able to critically evaluate various real-life situations by resorting to an analysis of key issues and factors. 2. This Aptitude Training helps them to demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions. 3. To categorize, apply and use thought process to distinguish between concepts of Quantitative methods.	**Student will be able to:** 1. Students shall understand the concepts of Quadratic Equation, AP, GP, and HP. 2. Students shall understand the concepts of Averages and Mixture and allegations 3. Students shall understand the concepts of Blood relations CO Students shall understand the concepts of cubes and Dice problem. 4. Students shall understand the concepts of clocks and Calendars.

Unit I	**[6 Hrs]**
Aptitude: Quadratic Equation Arithmetic progression, Geometric progression, Harmonic progression Imax: Critical Thinking, Interview Simulation, Engineering Leadership, Spatial Reasoning	
Unit II	**[6 Hrs]**
Aptitude: Average Mixture and Allegation Imax: Interactive Interview Training, Start-Up & Entrepreneurship,	
Unit III	**[6 Hrs]**
Aptitude: Blood Relation :- Family Tree, Coding Blood Relation, Pointing to a Person Problem Imax: Engineering Ethics, Employability, Engineering Judgment	
Unit IV	**[6 Hrs]**
Aptitude: Cubes and Dice Problems:- Number of cuts to be made, Number of colorful Faces of Cubes, Hidden Dice Number Imax: Disposition for Innovation, Disposition for Start up	
Unit V	**[6 Hrs]**
Aptitude: Clocks - Angle made by Hour hand, Minutes hand, Mirror and water Image of Clock, Behind and Ahead time concept of Calendars, day on Specific date, Coded Calendars Problems, Calendars repetition Imax: Creating A Winning Resume, Patriotism Self - respect & Start - up	

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Quantitative Aptitude	R.S.Agrawal		S.Chand and Company Pvt. Ltd
2.	Quantitative Aptitude	Shripad Deo		Allied Publishers Pvt. Ltd
3.	Quantitative Aptitude	Dinesh Khattar		Pearson Publishing House

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Quantitative Aptitude for CAT	Arun Sharma		McGraw Hill Education

FOURTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation			
						MSE	CA	ESE	Total
24ME431M	MDM – II Project Management	3	-	-	3	20	20	60	100

Course Objectives	Course Outcomes
1. To provide students with a comprehensive understanding of project management concepts 2. To equip students with the skills to organize human resources, and contracting 3. To enable students to apply tools and techniques for project planning, and understand evaluating performance indicators	**Student will be able to:** 1. Summarize a comprehensive understanding of project management concepts, and the roles and responsibilities of a project manager. 2. Develop the ability to organize human resources effectively by understanding delegation, team building, and project organization, while demonstrating the skills and responsibilities required for project management. 3. Interpret effective systems and procedures for project management, 4. Apply project management and allocation model for time and cost optimization 5. Interpret and utilize performance indicators to evaluate project success.

Unit I	**[9 Hrs]**
Concepts of Project Management: Concepts of projects, characteristics of project, Phases of project life cycle, Tools and techniques for project management, Role and Responsibility of Project Manager, Project Manager as a profession. **Project Planning and estimating: Concepts of** Feasibility report, Preparation of cost estimation, Evaluation of the project profitability.	
Unit II	**[9 Hrs]**
Organizing Human Resources and Contracting: Delegation, Skills / abilities required for project manager, Authorities and responsibilities of project manager, Project organization, Contracts, Tendering and Selection of contractors, Team Building	
Unit III	**[9 Hrs]**
Organizing Systems and Procedures for project management: Working of systems, Design of Systems Work Breakdown Structure (WBS), Project Execution plan , Project Direction Communication Coordination Control, Scheduling	
Unit IV	**[9 Hrs]**
Tools and techniques of project management: Bar (GANTT) chart, Networks – PERT and CPM, Applications, Basic steps in PERT/CPM, Rules for drawing network diagram, Labeling, Time estimates, Critical Path Method, Project Evaluation and Review Technique (PERT)	
Unit V	**[9 Hrs]**
Performance measures in Project Management: Performance indicators, Performance Improvement, Project management and environment.	

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Project Management	S Choudhry	2010	Tata McGraw-Hill
2.	Projects: Planning, Analysis, Financing, Implementation, and Review	Prasanna Chandra	2005	Tata McGraw-Hill
3.	Operations Research and Engineering Management.	S. D. Sharma,	2010	Kedar Nath Ram Nath & Co

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Project management a system approach to planning scheduling and controlling	Harold Kerzner	2002	CBS Publisher and distributors
2.	A management guide to PERT and CPM	Weist and Levy	2002	Eastern Economy of PH

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