COURSE NUMBER	COURSE TITLE	SEMESTER
MEM101	**Graphics Science**	**FIRST**

1. Understand plane geometry by drawing different engineering curves like ellipse, epicycloids, hypocycloid archemedian spiral, involute etc.
2. Understand projection methods with specific focus on orthographic projections
3. Draw orthographic projections of lines, planes and solids.
4. Draw sections of solids including cylinders, cones, prisms and pyramids.
5. Draw inter section of solids and development of surfaces.
6. Construct isometric scale, isometric projections and views.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM102	**Engineering Drawing – I**	**FIRST**

1. At the end of the course a student will be able to understand the concepts of Engg. Drawing & Standard Practice to be adopted in Engg. Drawing by the Students of Engineering.
2. The student will have the basic understanding projection of Points, Lines, Planes and Solids.
3. The student will be able to understand & draw the section of solids, intersection of surfaces and development of surfaces and learn about their physical significance.
4. The student will have a working knowledge of isometric projections and plane geometry consisting of various curves such as parabola, ellipse, Hyperbola, Involutes, cycloids and helix.
5. The student will be able to apply the learned concepts of engineering Drawing in the industries as well as use it for visual representation of their Engineering Ideas.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM103	**MANUFACTURING PROCESSES I**	**FIRST**

1. The student will be having the capability of selecting suitable manufacturing processes to manufacture the products optimally.
2. The student will be able to recommend the appropriate design of casting process systems, forming processes, welding process and machining (metal cutting) processes.
3. The student will be able to develop simplified manufacturing processes with the aim of reduction of cost and manpower.
4. The student will be able to identify/control the appropriate process parameters, and possible defects of manufacturing processes so as to remove them.
5. To student will be able to increase technical understanding and broaden perspective of the manufacturing world in which he will contribute talents and leadership

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM104	**WORKSHOP PRATICE I**	**FIRST**

1. To be able to make different moulds from patterns of (A) bevel-gear (B) Fan back cover (c) Pulley (D) Final handle
2. To be able to practice casting process
3. To be able to be aware of fitting tools & learn practically the process of filing, hexoing, making, cutting, measuring, etc. on mild steal pieces.
4. To be able to be aware of carpentry tools & learn planning, marking measuring, cutting by different chisels, sawing on wood.

5. To be able to learn making different wooden Joints.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM201	**Engineering Thermodynamics**	**THIRD**
1. To understand basic concept of thermodynamics and its properties 2. To generate the ability to differentiate different forms of energy i.e. heat and work 3. To apply first law of thermodynamics to closed and flow systems. 4. To realize the need of second law of thermodynamics, spontaneity and irreversibility in nature. 5. To deduce the necessity and use of properties of pure substances. 6. To learn basic concepts of real gases and working of external and internal combustion engines.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM202	**Engineering Mechanics-1**	**SECOND**
1. To develop ability to model and analysis of mechanical engineering systems using vectorial representation of forces and moments. 2. To be able to draw the free body diagrams of mechanical components and systems. 3. Equilibrium analysis of rigid bodies structures and frames and machines. 4. To understand the phenomenon of friction and ability to solve problem related to the same. 5. Ability to draw shear force diagram and banding moment for different types of beams taking into consideration their elastic nature. 6. To develop the understandings of fundamental principles of fluid statics and buoyancy. 7. Ability to apply the principles of virtual work.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM203	**Engineering Drawing – II**	**SECOND**
1. At the end of the course a student will be able to understand and apply the underlying basic principles Engineering Drawing –II comprising of Machine Elements and graphic statics 2. The student will be able to draw and learn about various types of riveted joints, welded joints, bolted joints, pins and cotters, knuckle and cotter joints screw threads, screw and screwed fastenings, pipes and pipe joints and understand the various conventions and notations used. 3. The student will be able to understand and draw the various Bearings and brackets used in engineering practice. 4. The student will be able to draw free hand sketch various steam engine parts such as stuffing box, cross- head, Connecting Rod and Crank, Eccentric and Slide valve for practicing the concepts learned in the course. This will hone & enhance the visualizing skills of the students. 5. The student will be able to understand and apply concepts of graphic statics.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM204	**WORKSHOP PRATICE II**	**FIRST**
1. To be able to practice of different operations of lathe machines (a) Facing (b) Tapper Turning (c) Plain Turning (d) Step Turning etc. 2. To be able to practice of making v-block on Shaping Machine on C.I. Casting. 3. To be able to practice of making different shapes from cylindrical rod on milling machine		

(a) Hexagonal (b) Square & Triangular & practice of indexing.

4. To learn about different pattern allowances and practice of pattern of V- Block by fixing allowances
5. To be able to practice different smithy operations like upsetting, drawing down, setting down, bending and riveting.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEH291	**Mechanical Engineering Principles**	**SECOND**

1. Principles of simple machines, their components and performance measures.
1. Study of Engineering materials & their processing and Hand tools & machine tools used in workshop.
2. Mechanical working of metals and their alloys. Various sources of power.
3. Detailed study of Power Generation Systems.
4. Study of Automobile Engineering and Renewable Energy. Practical aspects of major Mechanical Engineering Laboratories such as Workshop, Hydraulics, Thermal Engg., Automobile Engg., Engg. Mechanics, Materials Testing, Materials Science, Heat transfer, IE and Renewable Energy Labs.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM301	**Engineering Mechanics-II**	**THIRD**

1. To develop the understanding of modeling dynamic systems of engineering using vectorial approach.
2. Ability to model the engineering components as particles to study their Kinematics.
3. To impart the knowledge of Newton's law of gravitation and Kepler's law.
4. Application of Newton's laws to particles and systems of particles.
5. Application of work energy principle, work momentum principle to particles and systems of particles.
6. To be able to draw the kinematic diagrams and kinetic diagrams.
7. Modeling and analysis of forces systems acting on rigid bodies to evaluate position velocity and acceleration.
8. Modeling and analysis of forces systems to evaluate their effect on rigid bodies by application of Newton's and Euler's law at 2D and 3D levels.
9. Work energy principles and impulse momentum principles as rigid bodies and systems of rigid bodies.
10. Fundamental understanding of mechanical vibrations and finding out natural frequency for mechanical systems.
11. Application of free damped and forced vibrations on mechanical systems.
12. To study satellite motion using Kepler's Law and to understanding the principles of central force motion.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM302	**Engg. Mech. Lab.**	**THIRD**

1. To be able to learn the concept of friction through inclined plain experiment.
2. To be able to understand application of friction in bearing.
3. To be able to understand practical application of mechanical advantages.
4. To be able to understand fundamental principal underlying different types of gearing.

5. To be able to understand the concept of fluctuation of energy and its practical use during mechanical energy storage process.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM303	**MANUFACTURING PROCESSES – II**	**THIRD**
1. To give detailed knowledge of cutting tool & their geometry, nomenclature, tool materials, their properties and detailed study of production & CNC lathes 2. To impart detailed knowledge about the powder metallurgy, metal powders. Plastics and plastic moulding methods. This will also provide knowledge about various methods of gear manufacturing and milling indexing etc. 3. A detailed knowledge of various finishing and super finishing processes such as grinding, honing, lapping and high speed machining will be imparted to the students. 4. To understand the Knowledge & various modern welding techniques such as arc, resistance welding techniques. Atomic hydrogen, TIG, MIG, thermit, friction & inertia, friction stir welding, under water welding & welding of various materials will be imparted to the students. 5. Detailed knowledge of modern machining process unconventional in nature such as EDM, EBM, ECM. LBM, PAM etc and hybrid machining will be provided to the students.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM304	**Applied Thermodynamics**	**THIRD**
1. Understand power producing cycles and refrigeration cycles with vapor and air as fluids. 2. Understand different processes in IC Engines, calculate BP, IP, FP and prepare Heat Balance Sheet. 3. Understand different laws governing gases and their mixtures 4. Understand steam boilers and their performance 5. Understand steam turbines and their performance 6. Understand compressors and condensers and their performance		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM305	**Thermal Lab. I**	**THIRD**
1. At the end of the course a student will be able to understand the concepts of practical aspects of the working of IC Engines, Compressors, Boilers and Steam Power Plant. 2. The student will learn the working of various boilers along with their mountings and accessories. 3. The student will be able to draw Valve Timing Diagram of a diesel engine. 4. The student will learn to conduct performance test of a diesel engine. 5. The student will understand the working of the ignition circuit of a petrol engine. 6. The student will be able to determine efficiency of both single and multi-cylinder Reciprocating Air Compressors and learn about their applications.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM306	**Engineering Drawing-III (Assembly Drawing)**	**THIRD**
1. Draw the assembly drawings (orthographic views of assembled object) of machine assemblies, boiler mountings & accessories, couplings, etc. from the part drawings (orthographic views of individual parts) as per their specified sequence of assembly. 2. Representation of materials used (Part or item list) in machine drawing.		

3. Understanding the concept of limits, fits, tolerances and surface finish and their utility in the industrial context. The representation of limits, fits, tolerances, surface finish, and machining symbols in machine drawing as per BIS norms.
4. Draw the detailed drawings of parts with dimensions of the given assembled object and various dimensioned views of the assembly.
5. Exposure of CAD tools in machine drawing.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM307	MECHANICS OF SOLIDS & FLUIDS	THIRD

1. At the end of the course a student will be able to understand the underlying basic principles Mechanics of Solids & Fluids
2. The student will have the basic understanding of stress, strain & Deformation, Bending, Bending Stress in axially loaded members and also learn to apply torsion, shear stress and twist in shafts subjected to torque. He will also be able to understand the behavior columns under different end conditions.
3. The student will be able to understand various types of flows in fluids and types of energies associated with the flow of fluids.
4. The student will be able to have a understanding of some flow measurement systems viz. mouthpiece, notches, orifices.
5. The student will be able to understand concepts of flow through pipes and open channels.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM308	Material	THIRD

1. To learn practical knowledge on variation of discharge with drop in head at orafic meter.
2. To be able to conceptualize and realize the concept of frictional co-efficient in a pipe flow.
3. To be able to estimate co-efficient of discharge of venturi meter and its effect and actual discharge rate.
4. To be able to estimate co-efficient of discharge at different heads of cylindrical mouth peace and its practical application.
5. To be able to estimate co-efficient of discharge at different heads of various notches and orifices and its practical application.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM310	Thermal Engg. Lab.	THIRD

1. Student will be able to understand the concepts of practical aspects of the working of IC Engines, Ignition system and hydraulic machines.
2. The student will be able to draw real time Valve Timing Diagram of a given set-up diesel engine.
3. The student will learn to conduct performance test of a diesel engine and various parameters.
4. The student will understand the working of the ignition circuit of a petrol engine.
5. Students will understand basic working concepts of hydraulic turbines
6. Students will learn about basic constructional details and working concepts of hydraulic pumps.

COURSE NUMBER	COURSE TITLE	SEMESTER
EGC381	Product manufacturing project	FOURTH

1. To be able to identify the products for the project.

2. To check the technical feasibility and financial viability of the project.
3. To discuss the above during brain solving session.
4. To prepare utility article as furniture jigs & fixtures. Science and Engineering models for demonstration.

COURSE NUMBER	COURSE TITLE	SEMESTER
EGC382	PRACTICAL TRAINING	THIRD

1. To undergo practical training in industries to Aquent with various shop floor activity
2. To undergo practical training in industries to Aquent with industrial environment and the problems faced in industries.

COURSE NUMBER	COURSE TITLE	SEMESTER
GKC381	Sc. Meth., G.K. & Current affairs III	THIRD

1. To be aware about our solar systems, earth rotation and revolution latitude and longitude. World-Continents. Oceans. Seas. Islands. Highest Peaks. Major Rivers.
2. To be aware of Main civilization of ancient times and their main features. World Wars-First and Second-Causes. Some important world & Indian personalities (Historical & Political).
3. To be able to aware about Important Indian newspapers, various political parties in India.
4. To be able to be aware about some important International monetary organizations. Currencies of different countries.
5. To be able to aware about Important Indian writers and their works.
6. To be able to aware about Current affairs from newspapers.

COURSE NUMBER	COURSE TITLE	SEMESTER
ASM401	MATERIAL SCIENCE	FOURTH

1. To be able to understand the classification of materials, bonding and the crystal structure.
2. To be able to identify and understand defects in crystals.
3. To be able to interpret the phase diagrams of materials, Iron Carbon Diagram.
4. To be able to understand transformation across various regions, pearlite transformation, TTT Diagram, Bainite and Martensite Transformation.
5. To be able to select suitable heat-treatment process to achieve desired properties of metals and alloys.
6. To be able to understand the basic mechanisms of diffusion and the factors governing them.
7. To be able to develop an understanding on the properties and applications of different steels in engineering applications.

COURSE NUMBER	COURSE TITLE	SEMESTER
ASM402	MATERIAL SCIENCE LAB	FOURTH

1. To be able to determine the strength of Cu in an unknown CuSo4 solution with the help of photochemical colorimeter
2. To able to study various types of cubic unit cells and Braveries lattices with the help of plastic models.
3. To be able to study the various symmetry elements in the seven basic crystal systems.
4. To be able to study the crystal structures of some materials metals, Ionic compounds and covalent compounds with the help of plastic models.
5. To be able to determine the crystal structure of a given cubic crystalline material with the

help of a powder pattern obtained from the debye-scherrer camera.
6. To be able to study the cooling curves of a given alloy
7. To be able to study the micro-structure of various alloys using image analysis system.
8. To be able to study the effect of heat treatment on cast iron and carbon steels.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM401	INSTRUMENTATION	FOURTH

1. At the end of the course a student will be able to understand different instruments and processes theoretically as well as experimentally.
1. The student will have the basic understanding of different characteristics of instruments viz. accuracy, precision etc.
2. The student will be able to understand various parameters for measurements and various measuring instruments.
3. The student will be able to have a philosophical understanding of some advanced measurement systems viz. mechanical and electrical actuators, X-ray diffraction etc.
4. The student will be able to apply the learned concepts in the industries as well as use different instruments for measurements.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM402	MECHANICS OF SOLIDS - I	FOURTH

1. Fundamental understanding of the concepts of stress and strain in mechanics of solids and material properties with ability to perform stress, strain, and deformation analysis.
2. Apply the fundamental concepts of principle of superposition, equilibrium, compatibility, force deformation, and stress-strain relationships to basic engineering structures
3. Develop a solid knowledge about deformation of axial members by physical insight into distribution of stresses and strains in structural members by determining stress, strain, and deformation of bars, trusses, and beams, and performing stress and strain transformations
4. Basic understanding of the method of superposition, flexibility method, and stiffness method as applied to statically determinate and indeterminate axial and torsional members, thin-walled tubes, bending of beams and buckling of columns.
5. The ability to design structural members given the dimensions, material properties such as force-displacement relationships, boundary conditions, loading, allowable stresses, and factor of safety.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM403	MATERIALS TESTING LAB	FOURTH

1. To understand property of hardness of different materials and be able to use Rockwell hardness testing machine for hardness test.
2. To be able to measure stiffness of various compositions of helical spring system.
3. To be able to us tensiometer for tensile test of sheet metal.
4. To understand the concept of impact and tested effects on a notched M.S. Specimen by Izod Impact Test.
5. To be able to understand deformation of a specimen by torsion.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM404	MECHANICS OF MACHINES - I	FOURTH

1. Develops understanding of kinematic pairs, mechanisms etc. Velocity & acceleration analysis by graphical methods. Special mechanisms.
2. Synthesis of mechanisms is studied by analytical and graphical methods. Study of

reciprocating engine mechanisms & flywheels.
3. To understand belts, ropes etc. and collars, pivots and clutches.
4. Studies governors (different types) and their various aspects. Also absorption & transmission Dynamometers.
5. To study gear teeth & their profiles (viz cycloidal & involute), interference in involute teeth. Gear trains: Studying compound and epi-cyclic trains.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM405	**Mechanics of Machines – I Lab.**	**FOURTH**

1. Understand the concept of Friction In Bearing and make analysis through experiment to find out its numerical value.
2. Analysis of Worm & Worm Wheel system and to find out different influencing parameters viz., mechanical advantage, velocity ratio, efficiency etc.
3. Analysis of differential wheel & axle system and to find out different influencing parameters viz., mechanical advantage, velocity ratio, efficiency etc.
4. Understand the concept of Moment of Inertia of Flywheel and make analysis to find out its numerical value.
5. Understand the concept of Friction In Screw Jack and movement of a block on inclined plane and make analysis through experiment to find out its numerical value.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM406	**ENGG. METROLOGY AND MEASUREMENTS**	**FOURTH**

1. Knowledge to measure the given mechanical elements and assemblies using linear and angular analog/digital measuring instruments.
2. Skill to check geometrical accuracy of given application.
3. Skill to measure and derive important dimensions of various thread forms and gears.
4. Skill to check the dimensions using the gauges.
5. Knowledge to select and measure variables using appropriate sensors and transducers.
6. Comprehend to work in quality control and quality assurances divisions in industries.
7. Knowledge to maintain quality in engineering products.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM409	**METROLOGY LAB**	**FOURTH**

1. Metrology Lab students will become familiar with the different instruments that are available for linear, angular, roundness and roughness measurements. They will be able to select and use the appropriate measuring instrument according to a specific requirement.
2. Measurement of lengths, heights, diameters by vernier calipers, micrometers etc.
3. Use of gear tooth vernier caliper for tooth thickness inspection and flange micro meter for checking the chordal thickness of spur gear.
4. Thread inspection with two wire/ three wire method.
5. Measurements using Optical Projector / Toolmaker Microscope.
6. Measurement of angle using Sine Center / Sine bar / bevel protractor

COURSE NUMBER	COURSE TITLE	SEMESTER
EGC481	**INDUSTRIAL VISITS**	**FOURTH**

1. To learn and understand organizational setup of various industries in real life
2. To be acquainted with various manufacturing processes in real life in various industries
3. To learn and experience various kinds of working layouts in industries

COURSE NUMBER	COURSE TITLE	SEMESTER
CSE481		FOURTH

1. To inoculate habit of compulsory participation in sports and games to devlope sports men sprit and competitiveness
2. Same as I in various literary Social and cultural activity for woking as a team and innovate ideas into useful creativity.

COURSE NUMBER	COURSE TITLE	SEMESTER
GKC481	Sc. Meth., G.K. & Current affairs III	THIRD

1. To be aware and learn knowledge about capitals languages religion location, major crops and mineral wealth of major countries of world
2. To be able to be aware of important event in the world history
3. To be able to have knowledge about UNO it's specialize agency major TTs glocks alliances and associations.
4. To be able to be aware about various literary works and their authors
5. To be able to learn various abbreviations, superlatives, sobriquets. And day to day current affairs

WORK EXPERIENCE COURSE (ON A CHOSEN SUBJECT)

COURSE NUMBER	COURSE TITLE	SEMESTER
ASW401	METALLURGICAL ANALYSIS	FOURTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
DPW401	COMMERCIAL ART	FOURTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEW401	AUTOMOBILE ENGINEERING	FOURTH

1. To be able to work and understand and experience the chesses and various major assemblies of automobiles.
2. To be able to assemble piston and connecting rod over a crank-shaft.
3. To study the gear train of an automobile engines.
4. To feel and experience lubrication system of automobile engines.
5. To have hands on experience of the working of brakes system of an automobile.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEW402	PHOTOGRAPHY	FOURTH

1. To be able to handle various photographic cameras and having functional knowledge of shutter speed diagram and variation of aperchers in professional photographic.
2. To have working of photographic films and developers.
3. To have working knowledge of developing and fixing negatives.
4. To have learn about various greats of photographic papers.
5. To have initial working knowledge of a color photographic.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEW403	REFRIGERATION & AIRCONDITIONING	FOURTH

1. To be able to have working knowledge of tools used in repair & maintenance of Refrigerator & Air conditioner.
2. To be able to understand assembly & components refrigeration & air conditioner like condensers, cooling coil etc.

3. To be able to practice gas welding & soldering
4. To be able to change gas in refrigerators
5. To have working knowledge of electric circuit in Refrigerator & Air conditioner.
6. To troubleshoot problem in refrigeration & Air conditioning
7. To be able to test for leakage etc. in refrigerators and air conditioners

COURSE NUMBER	COURSE TITLE	SEMESTER
MEW404	FURNITURE DESIGN & MANUFACTURING	FOURTH

1. To learn general manufacturing of principals of wooden & tubler steel furniture
2. To be able to work with different type of joints and caning polishing and finishing of wooden furniture
3. To learn intricacies of tubler steel furniture including tube bending, welding, spray painting and finishing.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM501	Fluid Mechanics	FIFTH

1. Understand the fundamental concepts of viscosity, surface tension, pressure (absolute and gage), flow visualization using pathlines, streaklines, and streamlines.
1. Understand the kinematics of fluid particles, including the concepts of substantive derivatives, local and convective accelerations, vorticity and circulation.
2. Understand the concepts of stream functions, velocity potentials, rotational vs. irrotational flows, vortex flows.
3. Apply conservation laws like Bernoulli's equations, conservation of mass, momentum to fluid flow problems in engineering applications
4. Understand the concepts of viscous boundary layers and compute drag and lift coefficients using the theory of boundary layer flows.
5. Determine flow rates, pressure changes, minor and major head losses for viscous flows through pipes and power transmission through pipes.
6. Analyze and design most economical section: Rectangular Trapezoidal and Circular sections in channel flow.
7. Formulate and solve one dimensional compressible fluid flow problems.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM502	Fluid Mechanics Lab	FIFTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM505	INDUSTRIAL ENGINEERING	FIFTH

1. Knowledge and skill required for the application of Industrial Engineering.
2. Will be able to list, justify and interpret productivity models in manufacturing and service organization.
3. Will be able to make suitable decision regarding location of the organization as well as layout of the department/work-stations with in the organization.
4. Will have knowledge of conducting work study, including method study and time study.
5. Will have necessary skills and knowledge to manage the production/operation department of any organization.
6. Will be able to plan, schedule and control a project work of an organization.

COURSE NUMBER	COURSE TITLE	SEMESTER
EGC581	DESIGN ENGG./ THEME DEVELOP. PROJECT	FIFTH

1.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
EGC582	**PRACTICAL TRAINING**	**FIFTH**
1.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
RDC581	**AGRICULTURAL ENGINEERING**	**FIFTH**
1.		

COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM503	**Mechanics of Solids II**	**FIFTH**
1.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM504	**Materials Testing Lab.**	**FIFTH**
1.		

COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM515	**PROBABILITY AND STATISTICS**	**FIFTH**
1.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM516		**FIFTH**
1.		

COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM601	**MECHANICAL ENGINEERING DESIGN I**	**SIXTH**
1.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM602	**MECHANICAL ENGG. DESIGN PRATICE I**	**SIXTH**
1.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM603	**METAL CUTTING & TOOL DESIGN**	**SIXTH**

1. It imparts the detailed knowledge of Mechanism of metal cutting, nomenclature of single & multipoint cutting tools, mechanism of chip formation, built up edges, mechanics of orthogonal & oblique cutting, cutting forces, factors affecting tool force, cutting speed, feed & depth of cut, surface finish and temperature distribution at tool chip interface.
2. It gives the detailed knowledge of tool wear and machinability which includes theories of wear, cutting fluids, tool life & factors governing tool life and machinability. It also gives the knowledge of Economics of metal machining which includes single & multi-pass machining operations and criteria & restrictions for selecting economical conditions.
3. It imparts the knowledge of Multipoint tools, its design considerations, power & force requirements for drilling, milling, broaches, chatter & its significance and surface roughness. It also gives the Casting design which includes theory of gate & riser design and application of design consideration.
4. It imparts the knowledge of presses and press design which consist of selection of press, classification, different operations such as blanking, piercing, bending, deep drawing &

force requirements for these operations. Progressive & compound dies etc.

5. It gives the detailed knowledge of jigs and fixtures (viz. design principles, locators & clamps, hydraulic & pneumatic clamping devices, jig bushing). Types and design of drilling jigs & fixtures, Poka yoke- fool proofing and concepts.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM604	**Production Engineering Lab.**	**SIXTH**

1. Study of machinability. Determination of its index for five commonly used industrial materials.
2. Study of cutting forces exerted in various machining processes and their determination.
3. Turning tool testing.
4. Testing of sand-moulds and cores for determining the mechanical properties/characteristics.
5. Sand testing for determining the GFN.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM605	**HEAT TRANSFER**	**SIXTH**

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM606	**HEAT TRANSFER LAB.**	**SIXTH**

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM609	**STREAM SEMINAR**	**SIXTH**

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM681	**ADVANCED OPTIMIZATION TECHNIQUES**	**SIXTH**

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
EGC681	**DESIGN ENGG./ THEME DEVELOP. PROJECT**	**SIXTH**

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
RDC681	**VILLAGE INDUSTRIES & ENTERPRENUERSHIP**	**SIXTH**

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM607	**Automobile Engineering**	**SIXTH**

1. Basic Understanding of automobile and its terminology.
2. Understanding of various types of power generating devices.
3. Application of engineering principles to automotive performance.
4. Understanding of Automobile sub systems eg power train, brakes, suspension etc.
5. Differentiate between types of clutch, gear box, rear axle drives, wheels and tyres, and their specific applications

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM608	**Automobile Engineering lab**	**SIXTH**

1. To identify various subsystems of chassis.

2. To identify engine components and its subsystems such as cooling, lubrication fuel supply system.
3. To introduce students to steering, suspension, braking systems.
4. To understand importance of tyre size and other specifications.
5. To understand working of various types of power transmission systems.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM611	STATISTICAL QUALITY CONTROL	SIXTH

1. Given a set of process data, characterize the process behavior using descriptive statistics.
1. Understand the relevance and importance of discrete & continuous probability
2. distributions in the context of statistical quality control.
3. Design, use, and interpret control charts for variables and attributes.
4. Design a Single / Double / Multiple sampling plan, construct its OC curve and
5. evaluate its effectiveness for a given process.
6. Understand the relevance and importance of reliability concepts in the context of
7. modern quality systems.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM612	STATISTICAL QUALITY CONTROL LAB	SIXTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM703	Refrigeration & Air Conditioning	SEVENTH

1. Understand the theory and concept of various types of Refrigeration systems.
2. Understanding of types of compressors, condensers, expansion devices.
3. Understanding of comfort and Industrial air conditioning.
4. Use of types of insulating materials and refrigerants.
5. Estimation of cooling load.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM704	Refrigeration & Air Conditioning Lab	SEVENTH

1. To expose the students to the basic knowledge of thermal equipment's and to develop experimental skills.
2. Identification of various components of cooling devices
3. Understand the working of Heat pump.
4. Calculate the cooling load of air conditioning systems.
5. Understand the working of Cooling tower, cold storage, ice plants.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM-708	MANAGERIAL ECONOMICS & INDUSTRIAL ORGANIZATION	SEVENTH

1. It gives detailed knowledge of Circular flow of economic activity, Nature of firm, Concept of economic profit, Economics and decision making, Functional relationships and Economic Models; Total Average and Marginal functions; Money, Bank and Exchange.
2. It describes the Demand Analysis, its type, Determinants, elasticities and Factors influencing demand
3. It imparts detailed knowledge of Production Function (Input-output relationship; least

cost combination of inputs), Factor productivities and Return to scale and Managerial uses of production function.

4. It gives knowledge of Cost Analysis, Economic concept of cost, Production and Cost; Cost functions.
   It also impart the knowledge of Market structure which includes Perfect Competition, Monopoly, Profit maximization price and output in short run & long run.
5. It imparts the detailed knowledge of Pricing, its Determinants and Pricing under different market structures

COURSE NUMBER	COURSE TITLE	SEMESTER
MEH701	MECHANICAL ENGINEERING PROJECT I	SIXTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEH702	SEMINARS	SIXTH

1. Students will learn to identity research and practical problems.
2. Students will analyze the real time system problems
3. Students will acquire awareness on latest technology and current trends in the field of their interest.
4. Learn about technical and paper report writing

COURSE NUMBER	COURSE TITLE	SEMESTER
EGC781	CO-OP TRAINING	SIXTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
RDC781	RURAL ENGINEERING PROJECT	SIXTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM701	Mechanics of Machines	SEVENTH

1. Understand the causes and effects of vibration in mechanical systems.
2. Develop schematic models for physical systems and formulate governing equations of motion.
3. Understand the role of damping, stiffness and inertia in mechanical systems
4. Understand forced vibrations, vibration isolators and absorbers, whirling of shafts and Analyze torsional systems , 2 rotor, 3 rotor and geared systems.
5. Understanding to solve problems using Rayleigh's, Dunkerley's and Holzer's methods.
6. Understand the gyroscopic effects in ships, aero planes and road vehicles.
7. Analyze balancing problems in rotating and reciprocating machinery.
8. Design cams and followers for specified motion profiles.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM702	Mechanics of Machines – II Lab.	SEVENTH

1. Understand the concept of Whirling of Shaft in different end conditions.
2. Understand the concept of functioning of Gyroscope.
3. Understand the working and functioning of Porter Governor
4. Understand the concept of Vibration in different machine components with the help of Exciter.
5. Understand the Universal Vibration Apparatus to get knowledge of vibration in single degree as well as in multiple degree conditions.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM705	Power Plant Engineering	SEVENTH

1. Understand and discuss the energy resources and energy systems available for the production of electric power
2. Explain the basic principles of diesel, thermal and nuclear power plants
3. Describe non-conventional energy sources and energy clean coal technologies
4. Carry out cost analysis and calculate various tariffs
5. Describe about vehicular and industrial pollution, its control and emission standards

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM706	MECHANICAL ENGINEERING DESIGN II	SEVENTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM707	MECHANICAL ENGG. DESIGN PRACTICE II	SEVENTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM721	DESIGN & SIMULATION OF WORK SYSTEMS	SEVENTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM722	DSGN&SIMULATION OF WORK SYSTEMS LAB	SEVENTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM725	Operations Research	SEVENTH

1. Student will be able to understand the basic concepts of operations research, modeling approaches and Formulate and solve engineering and managerial situations as Linear Programming Problem (LPP).
2. Student will learn Decision theories and will be able to apply decision tree analysis to solve decision problems for selecting best alternative.
3. Student will develop the ability to solve two person zero sum games using algebraic and graphical methods.
4. Student will be able to understand queuing models and apply queuing theory for performance evaluation of engineering and management problems.
5. Student will be able to solve Integer Programming problems for complete and mixed type integer solution using graphical and simplex approach.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM730	Method Engineering & Ergonomics	SEVENTH

1. At the end of the course a student will be able to understand different principles and application of Method Engineering and Ergonomics applied for enhancement for productivity at work place.
2. The student will have the basic understanding of different approaches and tools used for method Engineering.
3. The student will be able to understand various Concepts and techniques applied for work measurement.
4. The student will be able to have a philosophical understanding of some advanced time and motion study techniques viz. PMTS, MTA, WFS, (MTM1, MTM2, MTM3 & other MTM systems)

5. The student will be able to understand various Concepts of Ergonomics, occupational ergonomics and human factor engineering. 6. The student will be able to apply the learned concepts in the industry.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM731	**METHODS ENGINEERING& ERGONOMICS LAB.**	**SEVENTH**
1.		

COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM711	**MACHINE TOOL DESIGN & CONTROL**	**SEVENTH**
1.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM712	**FOUNDRY ENGINEERING**	**SEVENTH**
1.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM714	**GAS DYNAMICS**	**SEVENTH**
1.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM715	**THEORY OF ELASTICITY & PLASTICITY**	**SEVENTH**
1.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM716	**FINITE ELEMENT METHODS**	**SEVENTH**
1.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM717	**MECHANICS OF COMPOSITE MATERIALS**	**SEVENTH**
1.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM719	**STOCHASTIC PROCESSES**	**SEVENTH**
1.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM720	**MATERIALS MANAGEMENT**	**SEVENTH**
1. Student will gain the understanding of the role of a materials department in an organization. 2. Student will be able to analyze, compare and execute the activities of inventory management and control. 3. Student will be able to improve performance planning through use of MRP techniques with in capacity constraints. 4. Student will be able to identify materials requirement through various forecasting methods. 5. Student will be able to build store functions and vendor relations.		
COURSE NUMBER	**COURSE TITLE**	**SEMESTER**
MEM 728	**ADDITIVE MANUFACTURING FOR 3D PRINTING**	**SEVENTH**
1. Demonstrate the knowledge of Additive Manufacturing (AM). 2. Understand the operating principles, capabilities, and limitations of state-of-the-art AM methods and compare and contrast additive processes with conventional manufacturing		

methods in terms of rate, quality, cost, and flexibility.
3. Gain hands-on experience with desktop AM machines and understand the complete process by designing, fabricating, and measuring example parts.
4. Realize applications of AM across major industries and potential implications of AM technologies on product development.
5. Place AM in the context of the evolving manufacturing infrastructure.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM 729	ADDITIVE MANUFACTURING FOR 3D PRINTING LAB	SEVENTH

1. Gain hands on experience with AM machines.
2. Understand the complete process by designing, fabricating and measuring example parts.
3. Understand the operating principles, capabilities and limitations of Additive Manufacturing.

COURSE NUMBER	COURSE TITLE	SEMESTER
EEM724	FUZZY SYSTEMS	SEVENTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM719	STOCHASTIC PROCESSES	SEVENTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM727	PROJECT ENGINEERING & MANAGEMENT	SEVENTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
EEM724	FUZZY SYSTEMS	SEVENTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM723	INDUSTRIAL KINESIOLOGY	SEVENTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM724	INDUSTRIAL KINESIOLOGY LAB	SEVENTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM-801	BUSINESS MANAGEMENT	EIGHTH

1. It gives the Introduction to the business management and Historical evolution. It also gives the knowledge of characteristics, function, importance and Forms of Business Ownership.
2. It imparts the knowledge of Inventory Management (Principles, Economic Order Quantity), Integrated Logistics and Supply Chain Management. The Value Chain Concept. Information technology for Inventory Management. ERP, MI and DSS.
3. It imparts the understanding of Marketing Management, Marketing vs. Selling Concept, Marketing mix and Marketing Research.
4. This unit also gives the knowledge of Human Resource Management, Leadership & Motivation and Incentives for Effective Performance.
5. It gives the basic knowledge of Financial & Accounting Management, Financial Statements, Analysis of Financial Statements, Depreciation and Book Keeping.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM 802	MECHANICAL ENGINEERING PROJECT	EIGHTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEH801	SEMINARS	EIGHTH

1. Students will learn to identity research and practical problems.
2. Presentation skill on technical paper
3. Participate in discussions for enhancement of knowledge
4. Adapt professional ethics

COURSE NUMBER	COURSE TITLE	SEMESTER
RDC881	RURAL ENGINEERING PROJECT	EIGHTH

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM818	Hydraulic Machines	EIGHTH

1. To know the application of momentum principles and analyze the forces exerted by a jet of fluid on vanes of different shapes, either stationary or moving. Also student will be able to use dimensional analysis in solving fluid problems and plan hydraulic similitude studies.
2. Study and analyze the construction features and working principles of different classes of hydraulic turbines.
3. To understand the performance of turbines and also will be able to analyze the performance characteristic curves of hydraulic turbines.
4. To understand the selection criteria of turbines.
5. To understand different classes of pumps, their constructions features and further analyze their performance. Also to understand the constructional features of roto dynamic pumps as well as to analyses the performance of these pumps.
6. To understand the selection criteria of pumps.
7. To understand the constructional features of positive displacement pumps as well as to analyses the performance of these pumps.
8. To understand the selection criteria of pumps.
9. Understand the working principles of various hydraulic systems, hydraulic control systems and hydraulic transmission system

COURSE NUMBER	COURSE TITLE	SEMESTER

MEM819	Hydraulic Machines Lab	EIGHTH
1.		

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM813	SUPPLY CHAIN MANAGEMENT	EIGHT

1. Identify the goal of a supply chain, and evaluate the impact of supply chain decisions
1. on the success of a company.
2. Understand the importance of inventory in the supply chain context; develop skills to
3. manage inventory in the presence of uncertainty; and appreciate the concept of
4. 'Risk Pooling' in minimizing the impact of variability in a supply chain.
2. Explain the "bullwhip effect", and illustrate through examples, the flow of material
5. between supply chain partners.
3. Dwell on the concepts of strategic partnering and Vendor Managed Inventory, and
6. explain the importance of Design for Logistics in reducing variability across supply
7. chains.
4. Categorize the performance measures that are relevant to a supply chain.
8. 6. Compare the major applications of supply chain information technology.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM820/PME412	Automated Manufacturing Systems	EIGHTH/FOURTH

1. Manufacturing automation and its building blocks; The product cycle; Plant configurations; Economies of Scales and Scope; Performance measures; CAD/CAM; Current trends.
2. CAM: NC/CNC/DNC systems, Axes of motion, Interpolation schemes, Coordinate-, zero-, coding-, control-, positioning- and dimensioning- systems; CNC programming using languages such as the APT, G&M codes, ADAPT, EXAPT; Hierarchical NC. CAD/CAM synthesis. CAPP.
3. Manufacturing Systems' Control & Architecture: Manufacturing software review; Factory floor information systems; Control system architecture; Factory communication systems using MAP; The factory DBMS; PLCs.
4. Manufacturing flexibility; Controlled Strategies; FMS, HMS, CIMS; and Factories of the future.
5. Computer controlled machines; Automated Inspection and MHSs and their design; Robot programming using MCL, VAL-II, APT, etc.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM821/PME413	Automated Manufacturing Systems Lab.	EIGHTH/FOURTH

1. Study of CNC TC and MC along with the operations to be performed.
2. Preparation of CNC programs for 3 different jobs on CNC TC and manufacture them on FC Steels. Live production runs on the above machine tools after dry runs and simulations.
3. Preparation of CNC programs for 3 different jobs on CNC MC and manufacture them on

FC Steels. Live production runs on the above machine tools after dry runs and simulations.

4. Develop a robot program for different pick-and-place positions of job in FMC. Live demonstration on robot.
5. Study of PLCs used in FMSs.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM822	Bio-Medical Engineering	EIGHTH
1.		

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM823	Bio-Medical Engineering Lab	EIGHTH
1.		

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM825	Thermal Turbomachines	EIGHTH
1.		

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM816	I.C. Engine and Gas Turbine	EIGHTH

1. Describe the combustion phenomenon in SI and CI engines
2. Identify fuel metering and fuel supply systems for different types of engines
3. Explain and analyze rotary compressors
4. Carry out thermodynamic analysis of simple and improved gas turbine cycles
5. Explain jet propulsion system and their fuels

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM817	I.C. Engine and Gas Turbine Lab	EIGHTH
1.		

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM826	Industrial Safety Engineering	EIGHTH
1.		

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM824	Total Quality Management	EIGHTH

1. Develop an understanding on quality management philosophies and frameworks.
2. Adopt TQM methodologies for continuous process improvement.
3. Measure the cost of poor quality, process effectiveness and efficiency to identify areas for improvement.
4. Apply benchmarking, QFD, FMEA and business process reengineering to improve management processes.
5. Determine the set of indicators to evaluate performance excellence of an organization like ISO 9000, ISO 9001, ISO 14001.
6. Understand the basic concepts of Taguchi's Quality Engineering.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM809	Nano-Technology & Nano-Computing	EIGHTH

1. To introduce and provide a broad view of the nascent field of nanoscience and nanotechnology to undergraduates
2. Describe the basic science behind the properties of materials at the nanometre scale, and the principles behind advanced experimental and computational techniques for studying nanomaterials.
3. Be able to critique journal papers on nanoscience/nanotechnology
4. Understand basic and advanced concepts of nanoelectronic devices, sensors
5. Understand the applications of nanotechnology and nanoelectronics

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM811	**Futurology Study**	**EIGHTH**

1.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM812	**Non-Conventional Energy Engineering**	**EIGHTH**

1. Enable students to understand global and Indian energy scenario and importance of non-conventional energy sources
2. Analyze solar energy collection, storage and conversion systems
3. Understand the working principles of various non-conventional energy conversion systems like bio energy, geothermal energy etc.
4. Understand other direct energy conversion systems like fuel cells
5. Evaluate methods for generation of hydrogen power and production of hydrogen

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM814	**MANAGEMENT INFORMATION SYSTEMS**	**EIGHTH**

1. Need and importance of Information Systems in management.
2. Role of MIS in various functional areas of organization in decision-making.
3. Activities and analysis to design information system and necessary steps for acquiring an Information System in an organization.
4. Aware of various Information System solutions like ERP, CRM, Data warehouses and the issues in successful implementation of these technology solutions in any organization.
5. 5. Role of the ethical, social, and security issues of information systems.

COURSE NUMBER	COURSE TITLE	SEMESTER
MEM827	**OPERATIONS MANAGEMENT**	**EIGHTH**

1. Student will understand the strategic role of operations management in creating and enhancing a firm's competitive advantages
2. Student will understand key concepts and issues of OM in both manufacturing and service organizations
3. Student will understand the interdependence of the operations function with the other key functional areas of a firm
4. Student will apply analytical skills and problem-solving tools to the analysis of the operations problems.