DEPARTMENT OF MECHANICAL ENGINEERING

COURSE OUTCOMES

2015-2019 BATCH

SEMESTER 1

Course code & Course Name: MA101 CALCULUS

COs	DESCRIPTION
CO1	the student will be able to check convergence of infinite series
CO2	the student will be able to find maxima and minima of functions two variables
CO3	the student will be able to find area and volume using multiple integrals
CO4	the student will be able to apply calculus of vector valued functions in physical applications
CO5	the student will be able to visualize graph and surfaces using software or otherwise.

Course code & Course Name: PH100 ENGINEERING PHYSICS

COs	DESCRIPTION
CO1	Solve for the solutions and describe the behavior of a damped and driven harmonic oscillator in both time and frequency domains.
CO2	Define and explain the propagation of light in conducting and non-conducting media.
CO3	Define and explain the physics governing laser behaviour and light matter interaction ting and non-conducting media.
CO4	Apply wave optics and diffraction theory to a range of problems
CO5	Explain and calculate the physical effects of acoustic reflections, absorption, scattering, diffusion, diffraction, and propagation losses
CO6	Use advanced theoretical, numerical, and experimental techniques to model and analyze acoustical elements in musical instruments, the human voice, room acoustics, and audio

Course code & Course Name: BE100 ENGINEERING MECHANICS

COs	DESCRIPTION
CO1	Students will be able to apply and demonstrate the concepts of mechanics to practical engineering problems.
CO2	Students will be able to determine the properties of planes and solids.
CO3	Students will be able to apply fundamental concepts of dynamics to practical problems.

Course code & Course Name: BE101-02 INTRODUCTION TO MECHANICAL ENGINEERING SCIENCES

COs	DESCRIPTION
CO1	Students will have exposed to the different areas of Mechanical Engineering; gained idea about nature
CO2	Students gained idea about nature.
CO3	Students can understand scope and applications of Mechanical Engineering principles.

Course code & Course Name: BE103 INTRODUCTION TO SUSTAINABLE ENGINEERING

COs	DESCRIPTION
CO1	Able to appreciate and explain the different types of environmental pollution problems and their sustainable solutions
CO2	To be aware of problem related to global environmental issues
CO3	Able to apply the concepts of sustainability in their respective area of specialization
CO4	To understand the need of waste disposal and management

Course code & Course Name:CE100 BASICS OF CIVIL ENGINEERING

COs	DESCRIPTION
CO1	The students will be able to illustrate the fundamental aspects of civil engineering
CO2	The students should able to plan a building
CO3	Students will be able to explain about surveying for making horizontal and vertical measurements. They will able to illustrate the uses of various building materials and construction of different components of a building
CO4	They will able to illustrate the uses of various building materials and construction of different components of a building.

Course code & Course Name: CE110 CIVIL ENGINEERING WORKSHOP

COs	DESCRIPTION
CO1	The ability to practice civil engineering using up-to-date techniques, skills, and tools as a result of life-long learning ability to design and conduct experiments
CO2	An ability to design a system or component to satisfy stated or code requirements of Civil Engineering.
CO3	The students will be able to illustrate the fundamental aspects of civil engineering
CO4	The students should able to plan a building

Course code & Course Name: PH110 ENGINEERING PHYSICS LAB

COs	DESCRIPTION
CO1	An ability to apply knowledge of mathematics, science, and engineering
CO2	An ability to design and conduct experiments, as well as to analyze and interpret data.
CO3	An ability to identify, formulate, and solve engineering problems
CO4	Understanding of professional and ethical Responsibility
CO5	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
CO6	A recognition of the need for, and an ability to engage in life-long learning

SEMESTER 2

Course code & Course Name: MA102 DIFFERENTIAL EQUATIONS

COs	DESCRIPTION
CO1	Distinguish between linear, partial and ordinary differential equations. State the basic existence theorem for 1st order ODE's and use the theorem to determine a solution interval
CO2	Recognize and solve a non homogeneous differential equation. Find particular solutions to initial value problems.
CO3	Find the Fourier series representation of a function of one variable.
CO4	Knowledge in the Technic, methodology of solving Partial Differential Equations.
CO5	At the end of the course students will have acquired basic knowledge of differential equations and methods of solving them and their use in analyzing typical mechanical or electrical systems.

Course code & Course Name:CY100 ENGINEERING CHEMISTRY

COs	DESCRIPTION
CO1	Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.
CO2	Substitute metals with conducting polymers and also produce cheaper biodegradable polymers to reduce environmental pollution .Design economically and new methods of synthesis nano materials.
CO3	Have the knowledge of converting solar energy into most needy electrical.
CO4	Apply their knowledge for protection of different metals from corrosion. To prevents the monuments from getting corroded.
CO5	Recent trends in electrochemical energy storage devices.
CO6	Learn how to use different spectroscopy techniques for analysis purpose of simple molecules.

Course code & Course Name:BE110 ENGINEERING GRAPHICS

COs	DESCRIPTION
CO1	the student would have accomplished Fundamental Engineering Drawing Standards.
CO2	the student would have accomplished Dimensioning and preparation of neat drawings and drawing sheets.
CO3	the student would have accomplished Interpretation of engineering drawings
CO4	the student would have accomplished The features of CAD software

Course code & Course Name: BE102 DESIGN & ENGINEERING

COs	DESCRIPTION
CO1	To appreciate different elements involved in design and to apply them when they called for.
CO2	Aware of product centred and user centred aspects that makes in the design process.
CO3	To be aware of different stages in design process and results of incorporating other fields with engineering stream
CO4	Understand different stages in manufacturing of a designed product

Course code & Course Name: EC100 BASICS OF ELECTRONICS ENGINEERING

COs	DESCRIPTION
CO1	Student can identify the active and passive electronic components.
CO2	Student can setup simple circuits using diodes and transistors.
CO3	Student will get fundamental idea about basic communication systems and entertainment electronics.

Course code & Course Name: EE100 BASICS OF ELECTRICAL ENGINEERING

COs	DESCRIPTION
CO1	Gain preliminary knowledge in basic concepts of Electrical Engineering
CO2	Discuss the working of various dc and ac machines
CO3	To predict the behavior of any electrical and magnetic circuits.
CO4	To identify the type of electrical machine used for that particular application.
CO5	To wire any circuit depending upon the requirement
CO6	Understand working principle of various analogue electrical measuring instruments.

Course code & Course Name: ME110 MECHANICAL ENGINEERING WORKSHOP

COs	DESCRIPTION
CO1	Knowledge achieved to explain the various manufacturing process in the basic mechanical engineering workshop sections smithy, carpentry, assembling, welding etc.
CO2	Identify the various hand tools used in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.
CO3	Able to choose different measuring devises according to the work.
CO4	Ability to name and summarise the operations of various machine tools like lathe, milling, drilling and shaping machines.
CO5	Knowledge achieved to disassemble and assemble the machine like IC engines
CO6	Skill achieved to construct models by using basic mechanical workshop sections like welding, moulding, smithy, carpentry etc.

Course code & Course Name: EE110 ELECTRICAL ENGINEERING WORKSHOP

COs	DESCRIPTION
CO1	Draw and practice simple house wiring and testing methods
CO2	Develop practical workshop skills in the students.
CO3	Grasp the applications of workshop equipment, wiring accessories etc
CO4	Physical realization of the range of discrete and integrated semiconductor devices
CO5	Knowledge of protective devices in electric circuits like fuse, ELCB, MCB etc.

Course code & Course Name: CY110 ENGINEERING CHEMISTRY LAB

COs	DESCRIPTION
CO1	To equip the students to apply the knowledge of Chemistry and take up Chemistry related topics as parts of their project works during higher semester of the course.
CO2	To impart sound knowledge in the different fields of theoretical chemistry so as to apply it to the problems in engineering field.
CO3	To develop abilities and skills that are relevant to the study and practice of Chemistry.
CO4	To familiarize the students with different application oriented topics like new generation engineering material different instrumental methods etc
CO5	To enable the students to acquire the knowledge in the concepts of chemistry for engineering applications.

SEMESTER 3

Course code & Course Name: MA201 LINEAR ALGEBRA & COMPLEX ANALYSIS

COs	DESCRIPTION
CO1	students will be able to solve any given system of linear equations
CO2	students will be find the Eigen values of a matrix and how to diagonalize a matrix
CO3	students will be able to identify analytic functions and Harmonic functions.
CO4	students will be able to evaluate real definite Integrals as application of Residue Theorem
CO5	students will be able to identify conformal mappings
CO6	students will be able to find regions that are mapped under certain Transformations

Course code & Course Name: ME201 MECHANICS OF SOLIDS

COs	DESCRIPTION
CO1	Understand basic concepts of stress and strain in solids.
CO2	Determine the stresses in simple structural members such as shafts, beams, columns etc. and apply these results in simple design problems.
CO3	Determine principal planes and stresses, and apply the results to combined loading case.

Course code & Course Name: ME203 MECHANICS OF FLUIDS

COs	DESCRIPTION

CO1	Calculate pressure variations in accelerating fluids using Euler's and Bernoulli's equations
CO2	Become conversant with the concepts of flow measurements and flow through pipes
CO3	Apply the momentum and energy equations to fluid flow problems.
CO4	Evaluate head loss in pipes and conduits.
CO5	Use dimensional analysis to design physical or numerical experiments and to apply dynamic similarity

Course code & Course Name: ME205 THERMODYNAMICS

COs	DESCRIPTION
CO1	Understand the laws of thermodynamics and their significance.
CO2	Apply the principles of thermodynamics for the analysis of thermal systems

Course code & Course Name: ME210 METALLURGY AND MATERIALS ENGINEERING

COs	DESCRIPTION
CO1	Identify the crystal structures of metallic materials.
CO2	Analyze the binary phase diagrams of alloys Fe-Fe_3C, etc.
CO3	Correlate the microstructure with properties, processing and performance of metals.
CO4	Recognize the failure of metals with structural change.
CO5	Select materials for design and construction.
CO6	Apply core concepts in materials science to solve engineering problems.

Course code & Course Name: HS210 LIFE SKILLS

COs	DESCRIPTION
CO1	The students will be able to Communicate effectively.
CO2	The students will be able to Make effective presentations.
CO3	The students will be able to Write different types of reports.
CO4	The students will be able to Face interview & group discussion.
CO5	The students will be able to Critically think on a particular problem.

Course code & Course Name: ME231 COMPUTER AIDED MACHINE DRAWING LAB

COs	DESCRIPTION
CO1	Acquire the knowledge of various standards and specifications about standard machine components.
CO2	Make drawings of assemblies with the help of part drawings given.
CO3	Ability to select, configure and synthesize mechanical components into assemblies.
CO4	Apply the knowledge of fits and tolerances for various applications.
CO5	Able to model components of their choice using CAD software.
CO6	Get exposure to advanced CAD packages.

Course code & Course Name: CE230 MATERIAL TESTING LAB

COs	DESCRIPTION
CO1	Acquire the knowledge on mechanical behaviour of materials.
CO2	Conduct experiments determine the mechanical properties of materials.

SEMESTER 4

Course code & Course Name: MA202 PROBABILITY DISTRIBTIONS, TRANSFORMS

COs	DESCRIPTION
CO1	Discrete and continuous probability density functions and special probability distributions.
CO2	Laplace and Fourier transforms and apply them in their Engineering branch.
CO3	Numerical methods and their applications in solving Engineering problems.

Course code & Course Name: ME202 ADVANCED MECHANICS OF SOLIDS

COs	DESCRIPTION
CO1	Apply concepts of stress and strain analyses in solids.
CO2	Use the procedures in theory of elasticity at a basic level.
CO3	Solve general bending problems.
CO4	Apply energy methods in structural mechanics problems.

Course code & Course Name: ME204 THERMAL ENGINEERING

COs	DESCRIPTION
CO1	Integrate the concepts, laws and methodologies from the course in thermodynamics into analysis of cyclic processes.
CO2	To apply the thermodynamic concepts into various thermal application like IC engines, steam turbines, compressors.

Course code & Course Name: ME206 FLUID MACHINERY

COs	DESCRIPTION
CO1	Discuss the characteristics of centrifugal pump and reciprocating pumps
CO2	Calculate forces and work done by a jet on fixed or moving plate and curved plates
CO3	Know the working of turbines and select the type of turbine for an application.
CO4	Do the analysis of air compressors and select the suitable one for a specific application

Course code & Course Name: ME220 MANUFACTURING TECHNOLOGY

COs	DESCRIPTION
CO1	Acquire knowledge in various casting processes and technology related to them.
CO2	Understand the rolling passes required for getting required shapes of rolled products.
CO3	Discuss important aspects of forging techniques
CO4	Discuss sheet metal working processes and their applications to produce various shapes and products.
CO5	Acquire knowledge in various types of welding processes.

Course code & Course Name: HS200 BUSINESS ECONOMICS

Cos	DESCRIPTION
CO1	A student who has undergone this course would be able to make investment decisions based on capital budgeting methods in alignment with microeconomic and macroeconomic theories.
CO2	A student who has undergone this course would be able to analyse the profitability of the firm, economy of operation, determination of price under various market situations with good grasp on the effect of trade cycles in business
CO3	A student who has undergone this course would gain knowledge on Monetary theory, measures by RBI in controlling interest rate and emerging concepts like Bit Coin
CO4	A student who has undergone this course would gain knowledge of elementary accounting concepts used for preparing balance sheet and interpretation of balance sheet

Course code & Course Name: ME230 FLUID MECHANICS AND MACHINES LABORATORY

Cos	DESCRIPTION
CO1	Discuss physical basis of Bernoulli's equation, and apply it in flow measurement (orifice, Nozzle and Venturi meter), and to a variety of problems
CO2	Determine the efficiency and plot the characteristic curves of different types of pumps and

Course code & Course Name: ME232 THERMAL ENGINEERING LABORATORY

Cos	DESCRIPTION
CO1	Determine the efficiency and plot the characteristic curves of different types of Internal Combustion engines, compressors and blowers.

CO2	Conduct experiments for the determination of viscosity, calorific value etc of petroleum products.

SEMESTER 5

Course code & Course Name: ME301 MECHANICS OF MACHINERY

COs	DESCRIPTION
CO1	The students will be able to solve practical problems related to kinematics of mechanisms

Course code & Course Name: ME303 MACHINE TOOLS AND DIGITAL MANUFACTURING

COs	DESCRIPTION
CO1	Analyze various machining process and calculate relevant quantities such us velocities, forces and powers.
CO2	Identify and explain the function of the basic components of a machine tool.
CO3	Understand the limitations of various machining process with regard to shape formation and surface texture.
CO4	Apply cutting mechanics to metal machining based on cutting force and power consumption.
CO5	Understand the use of various machine tools and their fields of application.
CO6	Understand the principle and applications of grinding and super finishing operations.

Course code & Course Name: ME305 COMPUTER PROGRAMMING & NUMERICAL METHODS

COs	DESCRIPTION
CO1	The students will be able to write computer programs for numerical solutions for engineering problems like system of equations and heat equations.

Course code & Course Name: ME367 Non-Destructive Testing

COs	DESCRIPTION
CO1	The students will be able to differentiate various defect types and select the appropriate NDT methods for the specimen.

Course code & Course Name: HS300 PRINCIPLES OF MANAGEMENT

COs	DESCRIPTION
CO1	A student who has undergone this course would be able to manage people and organisations
CO2	A student who has undergone this course would be able to critically analyse and evaluate management theories and practices
CO3	A student who has undergone this course would be able to plan and make decisions for organisations
CO4	A student who has undergone this course would be able to do staffing and related HRD functions

Course code & Course Name: M E331 DESIGN PROJECT

COs	DESCRIPTION
CO1	Think innovatively on the development of components, products, processes or technologies in the engineering field
CO2	Analyse the problem requirements and arrive workable design solutions

Course code & Course Name: EE311 ELECTRICAL DRIVES & CONTROL FOR AUTOMATION

COs	DESCRIPTION
CO1	Select a drive for a particular application based on power rating.
CO2	Select a drive based on mechanical characteristics for a particular drive application.
CO3	Discuss the controllers used for automation

Course code & Course Name: EE335 ELECTRICAL AND ELECTRONICS LAB

COs	DESCRIPTION
CO1	Test and validate various types of electrical motors
CO2	Acquire knowledge on working of semiconductor devices.

Course code & Course Name: ME331 MANUFACTURING TECHNOLOGY LABORATORY – I

COs	DESCRIPTION
CO1	Identify various process parameters and their influence on surface properties of various metals.
CO2	Recommend appropriate speed, feed and depth of cut for various processes on lathe machine.
CO3	Position, hold and locate work material and cutting tools in various basic machine tools.
CO4	Choose suitable welding process for different metals.
CO5	Choose appropriate heat treatment process for different metals.

SEMESTER 6

Course code & Course Name: ME302 Heat and Mass Transfer

COs	DESCRIPTION
CO1	Apply principles of heat and mass transfer to engineering problems
CO2	Analyse and obtain solutions to problems involving various modes of heat transfer
CO3	Design heat transfer systems such as heat exchangers, fins, radiation shields etc.

Course code & Course Name: ME304 DYNAMICS OF MACHINERY

COs	DESCRIPTION
CO1	Develop the design and practical problem solving skills in the area of mechanisms
CO2	Understand the basics of vibration and apply the concepts in design problems of mechanisms.

Course code & Course Name: ME306 ADVANCED MANUFACTURING TECHNOLOGY

COs	DESCRIPTION
CO1	Become conversant with the non- traditional machining process and to appreciate the effect of process parameters on the surface integrity aspects during the non- traditional machining process.
CO2	Appreciate the use of an EDM as a non traditional method of machining complex and hard materials.
CO3	Prescribe a laser materials processing technique suitable for a given product with material, size, precision, and surface quality requirements.
CO4	Program and operate a CNC mill and lathe.
CO5	Select the tool material and machining process parameters.

Course code & Course Name: ME308 COMPUTER AIDED DESIGN AND ANALYSIS

COs	DESCRIPTION
CO1	Gain a basic knowledge on Computer Aided Design methods and procedures
CO2	Understand the fundamentals of solid modelling
CO3	Have a basic knowledge in finite element analysis procedures.

Course code & Course Name: ME312 METROLOGY AND INSTRUMENTATION

COs	DESCRIPTION
CO1	Understand the working of linear and angular measuring instruments.
CO2	Know the fundamentals of limits and limit gauges, various methods for measurement of screw thread and surface roughness parameters and the working of optical measuring instruments.
CO3	Get an exposure to advanced measuring devices and machine tool metrology.
CO4	Acquire an overview of mechanical measurement systems and principle of instruments for motion and dimension measurement.
CO5	Get basic idea about working principle and applications of devices for measurement of force and torque; strain and stress and temperature.

Course code & Course Name: ME368 Marketing Management

COs	DESCRIPTION
CO1	State the role and functions of marketing within a range of organizations.
CO2	Describe key marketing concepts, theories and techniques for analyzing a variety of marketing situations.
CO3	Identify and demonstrate the dynamic nature of the environment in which marketing decisions are taken
CO4	Synthesize ideas into a marketing plan

Course code & Course Name: ME332 COMPUTER AIDED DESIGN AND ANALYSIS LAB

COs	DESCRIPTION
CO1	Gain working knowledge in Computer Aided Design methods and procedures
CO2	Solve simple structural, heat and fluid flow problems using standard software

Course code & Course Name: ME334 MANUFACTURING TECHNOLOGY LABORATORY – II

COs	DESCRIPTION
CO1	Provide programming practice on CNC machine tools
CO2	Impart knowledge on the fundamental concepts and principles of metrology
CO3	Explain the need of various modern measuring instruments and precision measurements

Course code & Course Name: EC352 COMPREHENSIVE EXAM

COs	DESCRIPTION
CO1	The students will be confident in discussing the fundamental aspects of any engineering problem/situation and give answers in dealing with them.

SEMESTER 7

Course code & Course Name: ME401 DESIGN OF MACHINE ELEMENTS - I

COs	DESCRIPTION
CO1	Find out various stresses induced in a machine element under different type of loading conditions.
CO2	Devise machine components for its conceptual design.

Course code & Course Name: ME403 ADVANCED ENERGY ENGINEERING

COs	DESCRIPTION
CO1	Understand energy scenario and the environmental effects of energy conversion.
CO2	Become aware of different renewable energy sources and choose sustainable energy

Course code & Course Name: ME 405 REFRIGERATION AND AIR CONDITIONING

COs	DESCRIPTION
CO1	Understand the principles refrigeration of air-conditioning and basic design considerations.
CO2	Carry out analysis of refrigeration cycles.
CO3	Apply the concepts of indoor environmental comfort.
CO4	Perform psychrometric calculations, humidity control and analysis of air-conditioning processes
CO5	Know the various applications of Refrigeration and air conditioning

Course code & Course Name: ME407 MECHATRONICS

COs	DESCRIPTION
CO1	Know the mechanical systems used in mechatronics
CO2	Integrate mechanical, electronics, control and computer engineering in the design of mechatronics systems

Course code & Course Name: ME409 COMPRESSIBLE FLUID FLOW

COs	DESCRIPTION
CO1	Formulate and solve problems in one -dimensional steady compressible flow including: isentropic nozzle flow, constant area flow with friction (Fanno flow) and constant area flow with heat transfer (Rayliegh flow).
CO2	Derive the conditions for the change in pressure, density and temperature for flow through a normal shock.
CO3	Determine the strength of oblique shock waves on wedge shaped bodies and concave corners
CO4	Know the various measuring instruments used in compressible flow

Course code & Course Name: ME463 Automobile Engineering

COs	DESCRIPTION
CO1	Practically identify different automotive systems and subsystems.
CO2	Understand the principles of transmission, suspension, steering and braking systems of an automobile
CO3	Develop a strong base for understanding future developments in the automobile industry

Course code & Course Name: ME451 SEMINAR & PROJECT PRELIMINARY

COs	DESCRIPTION
CO1	Analyze a current topic of professional interest and present it before an audience
CO2	Identify an engineering problem, analyze it and propose a work plan to solve it
CO3	Student develops the capability to work in a team to design and implement a solution to the problem with the help of appropriate tools
CO4	Student develops the skills required to present and defend his/her work
CO5	Student understands the role of time management in the implementation of the project

Course code & Course Name: ME431 MECHANICAL ENGINEERING LAB

COs	DESCRIPTION
CO1	Conduct experiments to determine thermal conductivity of materials
CO2	Determine heat transfer coefficient, LMTD etc..
CO3	Do calibration of thermometers and pressure gauges
CO4	Demonstrate the effect of unbalances resulting from rotary motions
CO5	Visualise the effect of dynamics on vibrations in single and multi degree of freedom system
CO6	Demonstrate the working principle of governor /gyroscope and demonstrate the effect of forces and moments on their motion

SEMESTER 8

Course code & Course Name: ME 402 Design of Machine Elements-II

COs	DESCRIPTION
CO1	Apply design procedures for industrial requirements.
CO2	Design machine components to ease the manufacturing limitations.

Course code & Course Name: ME404 INDUSTRIAL ENGINEERING

COs	DESCRIPTION
CO1	Know various tools and techniques in industrial Engineering.
CO2	Develop work procedure applying the principles of work study.
CO3	Apply inventory control techniques in materials management.
CO4	Formulate replacement and purchase decisions and arrive at conclusions

Course code & Course Name: ME476 Material Handling & Facilities Planning

COs	DESCRIPTION
CO1	Assess the value of facility planning on the strategy of a firm
CO2	Develop a systematic plant layout
CO3	Know the environmental and economical aspects in facilities planning
CO4	Understand various material handling systems

Course code & Course Name:CE482 ENVIRONMENTAL IMPACT ASSESSMENT

COs	DESCRIPTION
CO1	To have a basic knowledge of various pollution sources and their impacts
CO2	To have a basic knowledge of various environmental pollution

Course code & Course Name: ME492 PROJECT

COs	DESCRIPTION
CO1	Think innovatively on the development of components, products, processes or technologies in the engineering field
CO2	Apply knowledge gained in solving real life engineering problems